EXPLANATORY NOTES

for

FOREST SERVICE

DEPARTMENT OF AGRICULTURE

Fiscal Year

1962

CONTENTS

PREFACE

Project statements -

The obligations shown in the project statements are on the basis of the appropriations and activities proposed in the 1962 Budget Estimates. In some project statements, the activities are further divided into subcategories, reflecting a more detailed description of the work conducted under the appropriation items.

Obligations reflected as subcategories in the project statements, while generally obtained from accounting records, in some instances represent the best approximation available. Wherever it has been necessary to distribute costs to activities for which total amounts cannot be taken directly from the accounts, every effort has been made to allocate such charges as accurately as possible based on other available information such as past experience, special studies, cost analyses, etc.

Pay act increase -

The budget estimates for 1962 include costs of $6,789,152 applicable to the 1962 base under appropriations to the Forest Service due to salary increases which became effective during fiscal year 1961 pursuant to P.L. 86-568. In 1961, a supplemental estimate in the amount of $5,100,000 is anticipated to meet fiscal year 1961 costs of salary increases in the Forest Protection and Utilization appropriation, and this amount has been reflected in the project statement.

Project statements in this document reflect total pay act costs which have been distributed to the various projects for 1961 and 1962 as non-add figures in brackets.

C O N T E N T S

FOREST SERVICE

Purpose Statement

The Forest Service is responsible for promoting the conservation and wise use of the country's forest and related watershed lands, which comprise one-third of the total land area of the United States. To meet its responsibility the Forest Service engages in three main lines of work, as follows:

1. Management, protection, and development of the National Forests and National Grasslands. The 185 million acres of national forests and national grasslands are managed under multiple use and for sustained yield. Under these principles natural resources of outdoor recreation, range, timber, watershed, and wildlife are utilized in a planned combination that will best meet the needs of the Nation without impairing productivity of the land. These management and utilization principles were recognized in the Multiple Use-Sustained Yield Act of June 12, 1960 (Public Law 86-517, 74 Stat. 215).

   In managing the National Forests, technical forestry is applied to the growing and harvesting of timber crops. Estimated harvest through timber sales in the fiscal year 1961 is 8.5 billion board feet. Grazing of approximately six million head of livestock is scientifically managed to obtain range conservation along with the use of the annual growth of forage. Watersheds are managed to regulate stream flow, prevent floods, and provide water for power, irrigation, navigation, and municipalities. Management includes the handling of more than 80,000,000 visits of people to the National Forests for recreation purposes. Scientific management is applied to the extensive wildlife resources. Receipts from timber sales, grazing permits, land rentals, and water power permits exceeded $148 million in 1960.

   The protection of the National Forests includes the control of forest fires, which numbered 12,501 in the first eleven months of the calendar year 1960; the control of tree diseases and insect epidemics; and the prevention of trespass.

   The major development activities of the National Forests are reforestation, revegatation, construction of roads, recreational facilities, housing, and other necessary improvements and land acquisition and exchanges.

2. Forest Research. The Forest Service conducts research in the entire field of forestry and the management of forest and related ranges. This includes the growth and harvesting of timber, its protection from fire, insects, and diseases, the protection and management of watersheds, and improved methods for development and management of recreation resources. It conducts studies in forest economics, marketing of forest products, and a survey of the present extent and potential growth and use of the Nation's forest resources. It also conducts research to develop new and improved products from wood and to increase efficiency of utilizing

forest products. Results of research are made available to owners of private forest and range lands, to public agencies which administer such lands, to forest products industries, and to consumers.

The Forest Service cooperates with the Agricultural Research Service of the Department by reviewing and appraising for technical adequacy forest research projects beneficial to the United States which are conducted abroad. These projects are carried out with foreign currencies under Section 104(k) of Public Law 480, as amended, and the dollar expenses of the Forest Service in connection with this work are paid from the appropriation "Forest Protection and Utilization."

3. Cooperation with State and private forest landowners is provided by the Forest Service to obtain better fire protection on the 435 million acres of State and privately-owned forest lands and to stimulate development and proper management of these forest lands.

Under the Soil Bank Conservation Reserve Program the Forest Service is responsible for the technical phases of planting trees on land heretofore used for crop production, and for tree seedling production, primarily through the facilities of State forestry departments.

Other work related to forestry includes:

4. Insect and disease control. Activities to suppress and control destructive insects and diseases that threaten timber areas include two types of work carried on jointly by Federal, State, and private agencies: (a) Surveys on forest lands to detect and appraise infestations of forest insects and infections of tree diseases and determination of protective measures to be taken, and (b) control operations to suppress or eradicate forest insects and diseases, including white pine blister rust.

5. Flood Prevention and Watershed Protection. On National Forest lands and on non-Federal forest lands within the watersheds authorized for treatment by the Department of Agriculture under the Flood Control Act of December 22, 1944, the Forest Service plans and installs watershed improvement measures, in the form of minor physical structures, cultural measures, and intensified fire control, to retard runoff and reduce flood water and sediment damage. Work on non-Federal land is carried on in cooperation with the Soil Conservation Service and the appropriate State and local agencies.

The Forest Service also cooperates with the Soil Conservation Service, appropriate State agencies and the local organizations sponsoring small watershed protection and flood prevention projects initiated under the Watershed Protection and Flood Prevention Act of 1954, as amended, in planning and installing forestry and related measures on the watersheds and in inter-agency studies of proposed water and land resource developments on river basins for the purpose of obtaining integrated resource development programs.

6. Work performed for others. The Forest Service is frequently called upon to perform services for other Federal, State, and private agencies on a reimbursable or advance payment basis. Examples of these activities are:

   a. Protection of other Federal and non-Federal forest lands intermingled with the National Forests.

   b. Disposal of slash resulting from sales of timber and the rehabilitation of such areas.

   c. Construction and maintenance of roads, and other improvements.

   d. Research investigations in forest, range, and water management and utilization problems.

   e. Cooperative survey, mapping, administrative, and reforestation projects, etc.

   f. Cooperation with defense and mobilization agencies on forest production and utilization projects, and related work.

The Forest Service maintains its central office in Washington with program activities decentralized to 10 Regional Offices, 127 Forest Supervisors' offices, 802 District Rangers' offices, 9 Forest and Range Experiment Stations, and the Forest Products Laboratory. On November 30, 1960, the Forest Service had a total of 21,228 employees including 583 full-time and 13 part-time employees in the central office and 18,414 full-time and 2,218 part-time employees in the field. The November 30 employment figures for the field are lower than average for the year because of seasonal factors. At the peak of the last field season the number of full-time employees was about 29,000 plus about 24,000 part-time and casual employees.

	Estimated Available, 1961	Revised Budget Estimates, 1962
Appropriated funds:		
National forest and other land management appropriations	a/ $129,449,700	$158,477,000
Research	18,778,000	23,278,000
Cooperation with States	12,408,800	17,009,000
Total appropriated funds (excluding permanent appropriations)	a/ 160,636,500	198,764,000

a/ Excludes $123,200 available from prior year balances.

Summary of Appropriations, 1961, and Revised Estimates, 1962

Appropriation Item	Estimated Available, 1961	Revised Budget Estimates, 1962	Increase (+) or Decrease (-)
Forest protection and utilization:			
Forest land management	$96,989,700	$118,517,000	+$21,527,300
Forest research	18,778,000	23,278,000	+4,500,000
State and private forestry cooperation	12,408,800	16,009,000	+3,600,200
Total, Forest protection and utilization	128,176,500	157,804,000	+29,627,500
Forest roads and trails	30,000,000	38,000,000	+8,000,000
Access roads	1,000,000	1,000,000	- -
Acquisition of lands for Superior National Forest	a/ 750,000	250,000	-500,000
Acquisition of lands for national forests, Special Acts	10,000	10,000	- -
Cooperative range improvements	700,000	700,000	- -
Assistance to States for tree planting	- -	1,000,000	+1,000,000
Expenses, brush disposal (permanent)	7,500,000	7,500,000	- -
Roads and trails for States (permanent)	14,170,000	11,370,000	-2,800,000
Forest fire prevention (permanent)	b/ 20,000	20,000	- -
Restoration of forest lands and improvements (permanent)	c/ 100,000	100,000	- -
Payment to Minnesota (permanent)	123,300	123,300	- -
Payments due counties, submarginal land program (permanent)	425,000	425,000	- -
Payments to school funds, Arizona and New Mexico (permanent)	139,700	139,700	- -
Payments to States and territories (permanent)	35,400,000	28,400,000	-7,000,000
Total	218,514,500	246,842,000	+28,327,500
Deduct permanent appropriations (shown in detail above)	d/ 57,878,000	48,078,000	+9,800,000
Total (excluding permanent appropriations)	e/160,636,500	198,764,000	+38,127,500

a/ In addition, $799 available from prior year balances.
b/ In addition, $4,580 available from prior year balances.
c/ In addition, $7,130 available from prior year balances.
d/ In addition, prior year balance of $24,682 available under the item "Construction of warehouse and related facilities, Salt Lake City, Utah."
e/ In addition, prior year balance of $122,401 available under the item "Acquisition of lands for Cache National Forest."

Forest Land Management

Adjustments in the Functional Distribution Under the "National Forest Protection and Management" Activity

To provide more information on the amounts used and estimated for the various functions within the "National Forest Protection and Management" activity, the justifications have for many years included a functional project breakdown. It is proposed to adjust the breakdown in order to provide more complete and informative data on the requirements for this activity.

By Administrative Order dated June 20, 1960, 3,821,527 acres of land utilization projects subject to Title III of the Bankhead-Jones Farm Tenant Act were designated as National Grasslands to be permanently administered as part of the national-forest system and under principles of multiple-use and sustained-yield. An additional 79,083 acres of land utilization projects have been established as national forest by Presidential proclamation dated November 8, 1960 and Executive Order of October 27, 1960. Legislation will be proposed to the 87th Congress to designate about 300,000 acres as national forests. This will leave only about 75,000 acres of land utilization project lands.

The main acreage of these lands which will not become national forest are the 3.8 million acres designated as National Grasslands.

The basic programs of the National Grasslands are essentially the same as those for the National Forests - that is, both are administered for outdoor recreation, range, timber, watershed and wildlife and fish purposes. Accordingly, discussion of fund needs in terms of functional program work is more informative than need based upon type of land. Also, such conversion will coincide with existing organizational structure for administration of the National Grasslands since resource divisions are responsible for their specific activities on both types of land. Consolidating, for example, all range resource management activities or timber activities under one line item will be more representative of the total resource management job and the cost of doing the work.

In view of change in status for these lands, it is proposed to eliminate the project line item "Land Utilization Projects", and transfer the $1,270,000 previously shown for this item to other national forest project items as shown in the table on the following page.

Proposed Adjustments in the Functional Project Structure for the National Forest Protection and Management Activity of the Forest Land Management Subappropriation

(Based on fiscal year 1961 appropriations)

Project Item	1961 Appropriation (adjusted)	Transfer of Land Utilization Project Funds	Totals in Proposed Revision
Timber resource management:			
(a) Sales administration and management	$21,580,000	$15,000	$21,595,000
(b) Reforestation and stand improvement	4,440,000	11,000	4,451,000
Recreation-public use	15,055,000	125,000	15,180,000
Wildlife habitat management	1,632,000	86,000	1,718,000
Range resource management:			
(a) Management	3,412,000	447,000	3,859,000
(b) Revegetation	1,825,000	86,000	1,911,000
(c) Improvements	2,188,000	200,000	2,388,000
Soil and water management	2,108,000	43,000	2,151,000
Mineral claims, leases, and other land uses	4,980,900	201,000	5,181,900
Land utilization projects	1,270,000	-1,270,000	- -
Forest fire protection	16,020,000	31,000	16,051,000
Structural improvements for fire and general purposes (construction and maintenance)	9,777,000	25,000	9,802,000
Rehabilitation of burns	1,050,000	- -	1,050,000
Subtotal	85,337,900	- -	85,337,900
Deduct amount advanced from "Cooperative Range Improvements"	-700,000	- -	-700,000
Total, National Forest Protection and Management	84,637,900	- -	84,637,900

(Revised)

(a) Forest Protection and Utilization

	Forest Land Management	Forest Research	State and Private Forestry Cooperation	Total
Appropriation Act, 1961	a/$92,159,700	$17,332,000	$12,334,800	a/$121,826,500
Supplemental appropriation (Second Supplemental Appropriation Act, 1961)	750,000	500,000	- -	1,250,000
Supplemental appropriation (Third Supplemental Appropriation Act, 1961), for pay act costs	4,080,000	946,000	74,000	5,100,000
Base for 1962	a/ 96,989,700	18,778,000	12,408,800	a/ 128,176,500
Revised Budget Estimate, 1962	a/118,517,000	23,278,000	16,009,000	a/ 157,804,000
Increase:				
Original budget estimate	+8,527,300	+1,500,000	+1,600,200	+11,627,500
Budget amendment	+13,000,000	+3,000,000	+2,000,000	+18,000,000
Total increase	+21,527,300	+4,500,000	+3,600,200	+29,627,500

a/ In addition, $700,000 is available by transfer from "Cooperative range improvements."

SUMMARY OF INCREASES, 1962

	Original Estimate	Budget Amendment	Total Increase
For Operation Multiple Use--the Program for the National Forests:			
(a) National forest protection and management	+8,377,100	+11,000,000	+19,377,100
(b) Insect and disease control	+150,200	+2,000,000	+2,150,200
(c) Forest research	+1,500,000	+3,000,000	+4,500,000
Subtotal	+10,027,300	+16,000,000	+26,027,300
For State and private forestry cooperation:			
(a) Cooperation in forest fire control .	+1,000,000	+1,554,000	+2,554,000
(b) Cooperation in forest management and processing	+500,000	+446,000	+946,000
(c) General forestry assistance	+100,200	- -	+100,200
Subtotal	+1,600,200	+2,000,000	+3,600,200
Total increase	+11,627,500	+18,000,000	+29,627,500

1. Forest Land Management:
 a. National forest protection
    (1) Timber resource managem
      (a) Sales administration
      (b) Reforestation and sta
    (2) Recreation-public use .
    (3) Wildlife habitat manage
    (4) Range resource manageme
      (a) Management .....
      (b) Revegetation .....
      (c) Improvements .....
    (5) Soil and water manageme
    (6) Mineral claims, leases,
    (7) Forest fire protection
    (8) Structural improvements
        (construction and main
    (9) Rehabilitation of burns
        Subtotal .....
      Deduct amount advanced
        Subtotal, National fo
 b. Fighting forest fires .....
 c. Insect and disease control:
  (1) White pine blister rust c
  (2) Other pest control .....
      Subtotal, Insect and di
 d. Acquisition of lands (Weeks

      Subtotal .....
    Deduct amount advanced from
     fighting forest fires ....

   Total, Forest Land Managemen

2. Forest Research:
 a. Forest and range management
 b. Forest protection research:
  (1) Forest fire research ....
  (2) Forest insect research ..
  (3) Forest disease research .
      Subtotal, Forest protec
 c. Forest products utilizatio
 d. Forest resources research:
  (1) Forest survey .....
  (2) Economics research .....
      Subtotal, Forest resour
 e. Forest research constructio

   Total, Forest Research .....

3. State and Private Forestry C
 a. Cooperation in forest fire
 b. Cooperation in forest tree
 c. Cooperation in forest mana
 d. General forestry assistance

   Total, State and Private For

Total, Forest Protection and Ut
Unobligated balance lapsing ...
Total pay act costs (P.L. 86-56

Total available or estimate ...
Transfer in 1961 estimates from
  Library, Agriculture" .....
Supplemental due to pay act cos
Total appropriation or estimate

a/ Includes allocations to the
b/ Represents obligations. App
   primarily, contractual servi
   year.

(Revised)

PROJECT STATEMENT

Project	1960	1961 Estimate	Increase: Original Estimate	Increase: Budget Amendment	Increase: Total	1962 Revised Budget
1. Forest Land Management:						
a. National forest protection and management:						
(1) Timber resource management:						
(a) Sales administration and management	$18,877,521	$21,595,000	$700,000	- -	$700,000 (1)	$22,295,000
(b) Reforestation and stand improvement	3,593,512	4,451,000	1,700,000	$3,400,000	5,100,000 (2)	9,551,000
(2) Recreation-public use	10,071,623	15,180,000	1,400,000	2,000,000	3,400,000 (3)	18,580,000
(3) Wildlife habitat management	1,172,177	1,718,000	400,000	750,000	1,150,000 (4)	2,868,000
(4) Range resource management:						
(a) Management	3,360,963	3,859,000	200,000	300,000	500,000 (5)	4,359,000
(b) Revegetation	1,573,740	1,911,000	200,000	350,000	550,000 (6)	2,461,000
(c) Improvements	2,121,766	2,388,000	200,000	350,000	550,000 (7)	2,938,000
(5) Soil and water management	1,554,987	2,151,000	500,000	700,000	1,200,000 (8)	3,351,000
(6) Mineral claims, leases, and other land uses	4,287,526	5,181,900	400,100	800,000	1,200,100 (9)	6,382,000
(7) Forest fire protection	14,162,103	16,051,000	2,000,000	1,100,000	3,100,000 (10)	19,151,000
(8) Structural improvements for fire and general purposes (construction and maintenance)	9,556,827	9,802,000	677,000	1,250,000	1,927,000 (11)	11,729,000
(9) Rehabilitation of burns	- -	1,050,000	- -	- -	- -	1,050,000
Subtotal	70,332,745	85,337,900	8,377,100	11,000,000	19,377,100	104,715,000
Deduct amount advanced from "Cooperative Range Improvements"	-700,000	-700,000	- -	- -	- -	-700,000
Subtotal, National forest protection and management	69,632,745	84,637,900	8,377,100	11,000,000	19,377,100	104,015,000
b. Fighting forest fires	26,403,659	5,000,000	- -	- -	- -	5,000,000
c. Insect and disease control:						
(1) White pine blister rust control	3,252,209	a/ 3,365,000	- -	- -	- -	a/ 3,365,000
(2) Other pest control	3,566,705	3,886,800	150,200	2,000,000	2,150,200 (12)	6,037,000
Subtotal, Insect and disease control	6,818,914	7,251,800	150,000	2,000,000	2,150,200	9,402,000
d. Acquisition of lands (Weeks Act)	98,467	100,000	- -	- -	- -	100,000
Subtotal	102,953,785	96,989,700	8,527,300	13,000,000	21,527,300	118,517,000
Deduct amount advanced from "Expenses, brush disposal" for fighting forest fires	-798,659	- -	- -	- -	- -	- -
Total, Forest Land Management	102,155,126	96,989,700	8,527,300	13,000,000	21,527,300	118,517,000
2. Forest Research:						
a. Forest and range management research	7,207,922	8,737,000	210,000	790,000	1,000,000 (13)	9,737,000
b. Forest protection research:						
(1) Forest fire research	812,004	1,029,000	127,000	193,000	320,000 (14)	1,349,000
(2) Forest insect research	993,504	1,165,000	300,000	125,000	425,000 (15)	1,590,000
(3) Forest disease research	804,753	980,000	150,000	275,000	425,000 (16)	1,405,000
Subtotal, Forest protection research	2,610,261	3,174,000	577,000	593,000	1,170,000	4,344,000
c. Forest products utilization research	2,794,698	3,527,000	570,000	380,000	950,000 (17)	4,477,000
d. Forest resources research:						
(1) Forest survey	1,508,667	1,583,000	- -	- -	- -	1,583,000
(2) Economics research	401,680	682,000	143,000	207,000	350,000 (18)	1,032,000
Subtotal, Forest resources research	1,910,347	2,265,000	143,000	207,000	350,000	2,615,000
e. Forest research construction	- -	1,075,000	- -	1,030,000	1,030,000 (19)	2,105,000
Total, Forest Research	14,523,228	18,778,000	1,500,000	3,000,000	4,500,000	23,278,000
3. State and Private Forestry Cooperation:						
a. Cooperation in forest fire control	10,093,792	10,120,500	1,000,000	1,554,000	2,554,000 (20)	12,674,500
b. Cooperation in forest tree planting	288,293	296,000	- -	- -	- -	296,000
c. Cooperation in forest management and processing	1,542,290	1,554,000	500,000	446,000	946,000 (21)	2,500,000
d. General forestry assistance	391,871	438,300	100,200	- -	100,200 (22)	538,500
Total, State and Private Forestry Cooperation	12,316,246	12,408,800	1,600,200	2,000,000	3,600,200	16,009,000
Total, Forest Protection and Utilization, Forest Service b/	128,994,600	128,176,500	11,627,500	18,000,000	29,627,500	157,804,000
Unobligated balance lapsing	144,400	- -	- -	- -	- -	- -
Total pay act costs (P.L. 86-568)	[- -]	[5,235,218]	[380,000]	[250,000]	[630,000]	[5,865,218]
Total available or estimate	129,139,000	128,176,500	11,627,500	18,000,000	29,627,500	157,804,000
Transfer in 1961 estimates from "Salaries and expenses, Library, Agriculture"	-19,000	- -				
Supplemental due to pay act costs	- -	-5,100,000				
Total appropriation or estimate	129,120,000	123,076,500				

a/ Includes allocations to the Department of the Interior: 1961, $368,610; 1962, $368,700.
b/ Represents obligations. Applied costs for 1960 are $132,095,274. The difference of $3,100,674 reflects, primarily, contractual services and equipment used in 1960 over contracts made and orders placed in that year.

INCREASES, 1962

The increase of $29,627,500 in the Forest Protection and Utilization appropriation is distributed as follows:

Operation Multiple Use--the Program for the National Forests	$26,027,300
State and Private Forestry Cooperation ..	3,600,200
Total	29,627,500

The increase of $26,027,300 plus the $12,000,000 of new contract authorization shown under the appropriation Forest Roads and Trails, or a total increase of $38,027,300, is needed for the second increment necessary to the orderly fulfillment of Operation Multiple Use--the Program for the National Forests.

Note:--When consideration is given to the estimated decrease of $2.8 million in 10% of national forest receipts for roads and trails and the decrease of $500,000 for Acquisition of Lands, Superior National Forest, then the net increase for the program is $34.7 million.

Despite substantial progress, management of the national forests is running behind public demands for use of its resources. There must be still more intensive development if the people of this country are to have full benefits of the national-forest system.

Operation Multiple Use is the accelerated program already under way to develop all national forest renewable resources to meet the increasing demands of an expanding population during the next 10 to 15 years. This program carries out the charge of Public Law 86-517 directing that the national forests be administered for multiple use and sustained yield. It has been described as a race against time to make the potential yields of water, recreation, timber, forage, and wildlife from these public forests keep up with the Nation's growing needs.

The goals of Operation Multiple Use are:

More and Better Water--Step up watershed management and protection to increase the quantity and improve the quality of water yields.

More Wood for the Nation--Increase annual harvest through intensified sustained-yield management of present timber stands; growing more and better trees; reducing disease, insect and fire losses; and improving utilization.

More Recreation for More Millions to meet the needs of an expected 130 million visits by 1969.

Better Hunting and Fishing to accommodate the dramatically increasing number of Americans seeking outdoor sport on streams, lakes and trails on the national forests.

Better Range, Better Grazing--Improve the range resource to achieve sustained high-level forage production and better watershed conditions through intensified management, better range practices, and more balanced use.

Intensified Protection to safeguard present national-forest values as well as planned future investments. This calls for additional measures to prevent, detect, and control forest insects and disease, and improve equipment and techniques for fire control.

An Expanded Road System to aid protection, open up more timber for management, provide greater access for people visiting the forest for recreation, and aid in multiple-use administration.

Boundary Adjustments and Ownerships Consolidation, where public and private lands are intermixed, are necessary for effective management.

Essential Structures and Equipment to keep pace with the resource development program. This includes operating bases, with headquarters and housing of personnel, new fire lookout stations, equipment warehouses and other service buildings.

Accelerated Research on a broad scale to aid and support the resource management and development program. Research must show the way to new methods in the management of timber, soil and water, forage, wildlife habitat, and recreation resources. To come up with quick results required during the short-term period will take additional laboratories, greenhouses, scientific equipment, and other facilities.

Operation Multiple Use will benefit every citizen. Whether it is wood obtained from these public properties, or water, recreation, wildlife or forage, or maintenance of jobs and creation of new jobs and payrolls, the utilization of national forest resources directly or indirectly enters into every American home. The furtherance of this program is one way in which the Federal Government discharges its responsibility of stewardship, and it is good business for the Nation.

In the initial presentation of the financial requirements of the Program for the National Forests to Congress it was explained that annual increases would be needed over a period of years until a maximum annual level of $320.6 million was reached. Attainment of this maximum level at a reasonably early date is essential if the objectives of Operation Multiple Use are to be accomplished within an approximate 12 year period.

The table which follows shows distribution by program activities of:

(a) maximum annual level of $320.6 million.
(b) amounts contained in the 1960 budget estimates for the program.
(c) increases provided for the program through 1961. It should be noted that this includes the 1961 supplemental for pay act costs which will not result in added program accomplishments.
(d) increases provided in the original 1962 budget.
(e) increases proposed in the 1962 budget amendment.
(f) amount remaining to be implemented.

Relationship to Labor Surplus Areas

The increases proposed for the National Forest Program including implementing forest research and the State and private cooperative programs would be distributed to field units on the basis of priority needs in the entire resource field. It should be pointed out, however, that such distribution of funds would coincide with a large number of labor surplus and low rural income areas.

Of the 186 million acres of land under Forest Service administration it is estimated that 63 million acres are in or adjacent to labor surplus areas and 9 million close to low rural income areas, or a grand total of 72 million acres. Included in the 63 million acre figure are about 21 million acres determined by local field offices to be labor surplus areas based on information from local employment offices. These are more recent figures than shown in "Area Labor Market Trends" of January 1961 and also include smaller areas than used in that report.

State and private cooperative programs include projects on 125 million acres in labor surplus areas and an additional 122 million acres in low rural income areas.

Therefore, the proposed increases will not only help to accelerate urgently needed resource development projects but also will help to accelerate the economy in areas of labor surplus and low rural income.

The map which follows the above referred to table illustrates the wide area of labor surplus and low rural income areas, in or adjacent to the location of Forest Service work programs.

The proposed increases of $29,627,500 (under the appropriation Forest Protection and Utilization) would be used on specific project items as outlined on pages that follow.

THE PROGRAM FOR THE NATIONAL FORESTS (Revised)

The following table shows the relationship of the maximum annual costs for each program category to the amounts provided to date and proposed in the 1962 Budget Amendment.

THE PROGRAM FOR THE NATIONAL FORESTS

(Revised)

The following table shows the relationship of the maximum annual costs for each program category to the amounts provided to date and proposed in the 1962 Budget Amendment.

Appropriation and project items	AMOUNTS PROVIDED AND PROPOSED							Amount remaining to be implemented in subsequent years (Col. 1 - 7)
	Maximum annual level (proposed to be reached by end of 5th year 1/)	In 1960 Budget Estimates	Increases through 1961 (includes $5.1 million estimated pay act supplemental)	Increase for 1962 In 1962 Budget	Increase for 1962 Proposed Amendment to 1962 Budget	Increase for 1962 Total	Total Revised Estimate for 1962 (Col. 2+3+6)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
FOREST PROTECTION AND UTILIZATION:								
FOREST LAND MANAGEMENT:								
National forest protection and management:								
Timber resource management:								
Sale administration and management	$26,919,000	$17,728,000	$3,867,000	$700,000		$700,000	$22,295,000	$4,624,000
Reforestation and stand improvement	41,119,000	3,265,000	1,186,000	1,700,000	$3,400,000	5,100,000	9,551,000	31,568,000
Recreation-public use	31,065,000	9,483,000	5,697,000	1,400,000	2,000,000	3,400,000	18,580,000	12,485,000
Wildlife habitat management	7,333,000	1,235,000	483,000	400,000	750,000	1,150,000	2,868,000	4,465,000
Range resource management:								
Management	7,365,000	3,365,000	494,000	200,000	300,000	500,000	4,359,000	3,006,000
Revegetation	3,683,000	1,671,000	240,000	200,000	350,000	550,000	2,461,000	1,222,000
Improvements	5,400,000	2,136,000	252,000	200,000	350,000	550,000	2,938,000	2,462,000
Soil and water management	11,106,000	1,641,000	510,000	500,000	700,000	1,200,000	3,351,000	7,755,000
Mineral claims, leases, and other land uses	11,715,000	4,409,000	772,900	400,100	800,000	1,200,100	6,382,000	5,333,000
Forest fire protection	28,855,000	13,700,000	2,351,000	2,000,000	1,100,000	3,100,000	19,151,000	9,704,000
Structural improvements for fire and general purposes (construction and maintenance)	18,630,000	8,901,000	901,000	677,000	1,250,000	1,927,000	11,729,000	6,901,000
Rehabilitation of burns	- -	- -	1,050,000	- -	--	--	1,050,000	-1,050,000
Subtotal, National forest protection and mgmt.	193,190,000	2/ 67,534,000	17,803,900	8,377,100	11,000,000	19,377,100	2/104,715,000	88,475,000
Insect and disease control:								
White pine blister rust control	2,500,000	2,100,000	111,300	- -	--	--	2,211,300	288,700
Other pest control	6,500,000	1,900,000	1,258,700	150,200	2,000,000	2,150,200	5,308,900	1,191,100
Subtotal, Insect and disease control	9,000,000	3/ 4,000,000	1,370,000	150,200	2,000,000	2,150,200	3/ 7,520,200	1,479,800
Acquisition of lands (Weeks Act)	100,000	100,000	- -	- -	--	--	100,000	--
Total, Forest Land Management	202,290,000	71,634,000	19,173,900	8,527,300	13,000,000	21,527,300	112,335,200	89,954,800
FOREST RESEARCH:								
Forest and range management research	12,873,000	4/ 3,440,000	1,857,000	210,000	790,000	1,000,000	4/ 6,297,000	6,576,000
Forest protection research:								
Forest fire research	2,047,000	513,500	244,000	127,000	193,000	320,000	1,077,500	969,500
Forest insect research	2,054,000	598,500	250,000	300,000	125,000	425,000	1,273,500	780,500
Forest disease research	1,340,000	484,000	240,000	150,000	275,000	425,000	1,149,000	191,000
Subtotal, Forest protection research	5,441,000	1,596,000	734,000	577,000	593,000	1,170,000	3,500,000	1,941,000
Forest products utilization research	6,828,000	1,397,200	713,600	570,000	380,000	950,000	3,060,800	3,767,200
Forest resources research:								
Forest survey	469,000	440,000	- -	- -	--	--	440,000	29,000
Marketing and economics research	1,689,000	140,000	353,000	143,000	207,000	350,000	843,000	846,000
Subtotal, Forest resource research	2,158,000	580,000	353,000	143,000	207,000	350,000	1,283,000	875,000
Subtotal, Research Program	27,300,000	7,013,200	3,657,600	1,500,000	1,970,000	3,470,000	14,140,800	13,159,200
Forest research construction	6,000,000	- -	1,075,000	- -	1,030,000	1,030,000	2,105,000	3,895,000
Total, Forest Research	33,300,000	4/ 7,013,200	4,732,600	1,500,000	3,000,000	4,500,000	4/ 16,245,800	17,054,200
TOTAL, FOREST PROTECTION AND UTILIZATION	235,590,000	78,647,200	23,906,500	10,027,300	16,000,000	26,027,300	128,581,000	107,009,000
FOREST ROADS AND TRAILS, including Roads and Trails for States (10%)	xxx	35,400,000	8,770,000	4,700,000	4,500,000	5/ 9,200,000	53,370,000	xxx
ACCESS ROADS	xxx	- -	1,000,000	- -	--	--	1,000,000	xxx
Total, Road Program	85,000,000	35,400,000	9,770,000	4,700,000	4,500,000	9,200,000	54,370,000	30,630,000
ACQUISITION OF LANDS FOR CACHE NATIONAL FOREST	- -	50,000	-50,000	- -	--	--	--	--
ACQUISITION OF LANDS FOR NATIONAL FORESTS, SPECIAL ACTS	10,000	10,000	- -	- -	--	--	10,000	--
ACQUISITION OF LANDS FOR SUPERIOR NATIONAL FOREST	- -	- -	750,000	-500,000	--	-500,000	250,000	-250,000
TOTAL, PROGRAM FOR THE NATIONAL FORESTS	320,600,000	114,107,200	34,376,500	14,227,300	20,500,000	6/ 34,727,300	183,211,000	7/ 137,389,000

Reconciliation to 1962 Budget Amendments:

Amounts in Estimates for work related to non-national forest land and therefore not a part of the National Forest Program:

(1) Insect and disease control	+1,881,800
(2) Forestry research	+7,032,200
(3) State and private forestry cooperation (increase in 1962 budget is $1,600,200; on Budget Amendment $2,000,000 or a total increase of $3,600,200). in addition Budget Amendment provides $1,000,000 for Assistance to States for Tree Planting	+17,009,000
Amount for fighting forest fires not included in program because of the emergency nature of this fund	+5,000,000
Less 10% of national forest receipts included in program but not in regularly appropriated items	-11,370,000
TOTAL UNDER BUDGET AMENDMENT (appropriated funds)	202,764,000

1/ Adjusted by transfer of amounts previously shown for Ranger District Management and Land Utilization Projects to other projects within "National forest protection and management".

2/ Includes $700,000 transfer from "Cooperative Range Improvements".

3/ Excludes $1,881,800 as explained in "Reconciliation" at bottom of table.

4/ Amounts shown exclude the portion of Forest Research related to non-national forest land which is not a part of the National Forest Program. For all research projects listed this amount totals $7,032,200 as shown in "Reconciliation" at bottom of table.

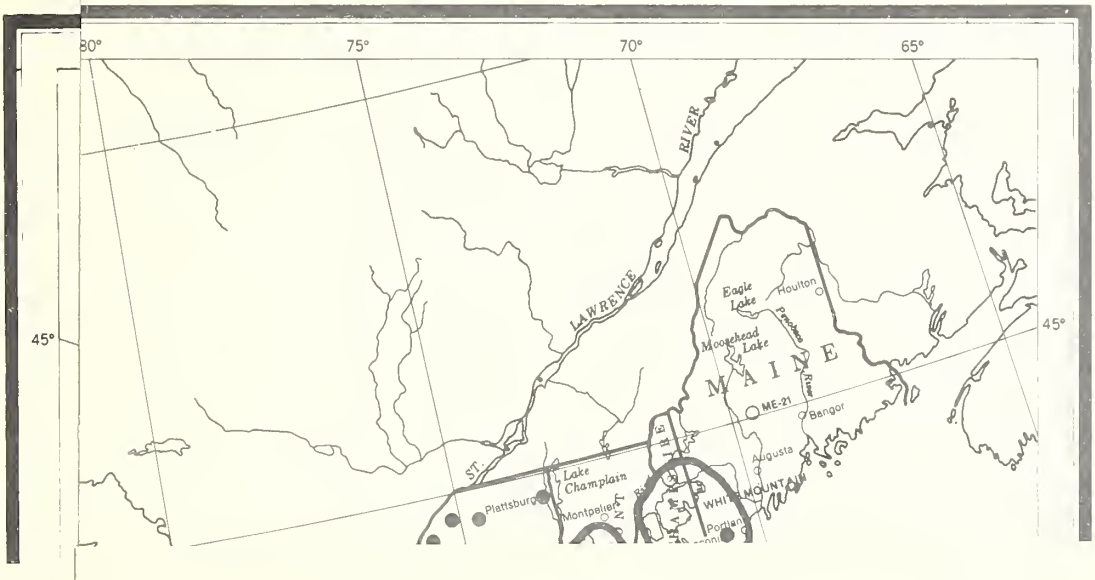
5/ The actual program increase under appropriated funds is $12,000,000 but this is offset by an estimated decrease of $2,800,000 in the 10% of national forest receipts applied to this program.

6/ When the reduction of $2,800,000 in 10% of national forest receipts and the $500,000 in Acquisition of Lands, Superior National Forest, are excluded, the actual program increase under regular appropriations total $38,027,300.

7/ This amount is understated by about $11 million due to increased Pay Act costs authorized subsequent to development of the Program for the National Forests.

(Revised)

DEP


80°
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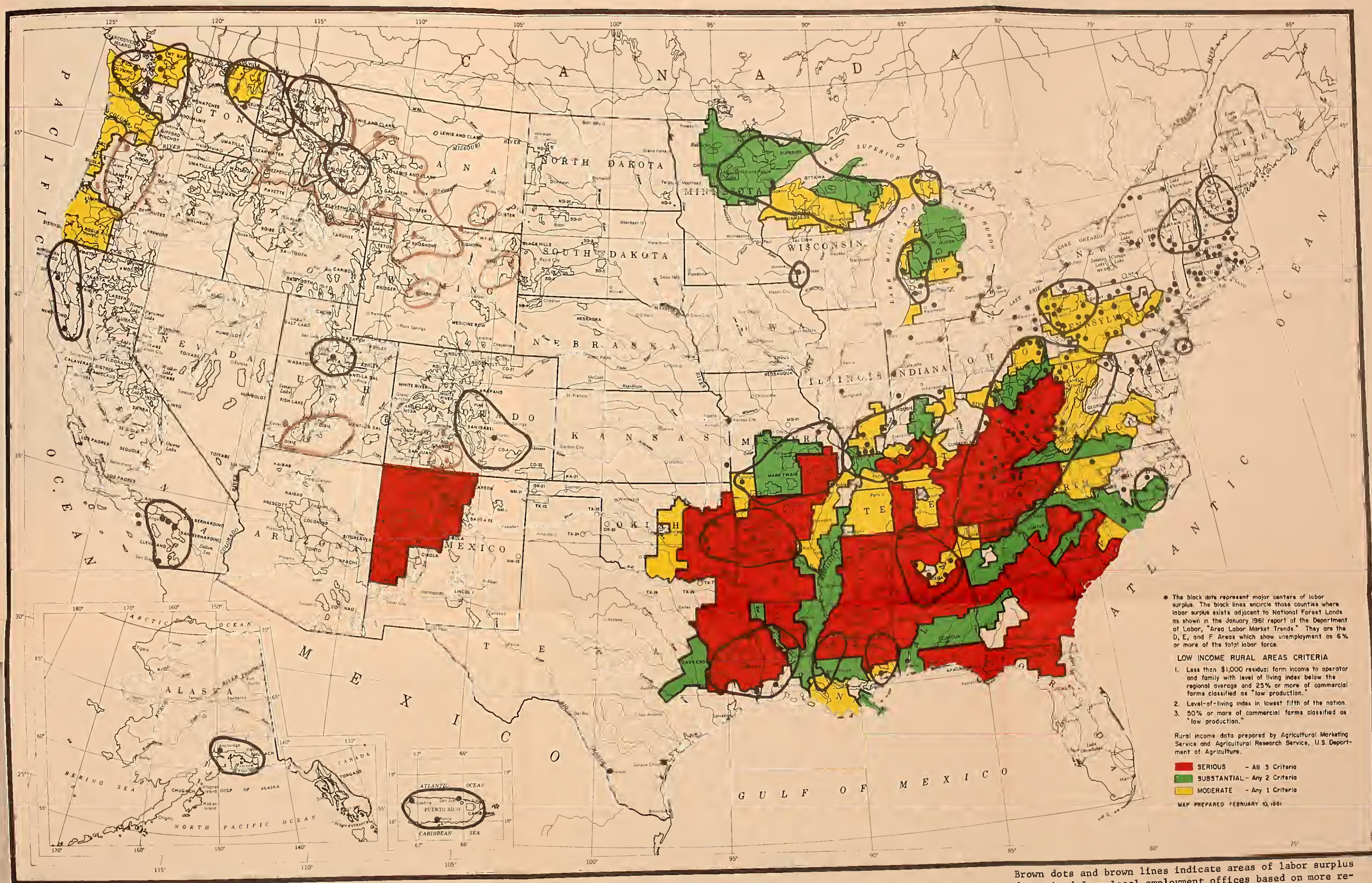
RIVER
LAWRENCE
ST.
Eagle Lake
Houlton
Moosehead Lake
Penobscot River
MAINE
ME-21
Bangor
Augusta
Lake Champlain
Plattsburgh
Montpelier
WHITE MOUNTAINS
Portland

UNITED STATES
DEPARTMENT OF AGRICULTURE
FOREST SERVICE

NATIONAL FORESTS AND OTHER LANDS ADMINISTERED BY THE FOREST SERVICE



- The black dots represent major centers of labor surplus. The black lines encircle those counties where labor surplus exists adjacent to National Forest Lands as shown in the January 1961 report of the Department of Labor, "Area Labor Market Trends." They are the D, E, and F Areas which show unemployment as 6% or more of the total labor force.

LOW INCOME RURAL AREAS CRITERIA

1. Less than $1,000 residual farm income to operator and family with level of living index below the regional average and 25% or more of commercial farms classified as "low production."
2. Level-of-living index in lowest fifth of the nation.
3. 50% or more of commercial farms classified as "low production."

Rural income data prepared by Agricultural Marketing Service and Agricultural Research Service, U.S. Department of Agriculture.

SERIOUS – All 3 Criteria
SUBSTANTIAL – Any 2 Criteria
MODERATE – Any 1 Criteria

MAP PREPARED FEBRUARY 10, 1961

Base map drafted from base compiled by the United States Geological Survey, 1959
Subject data compiled by the United States Forest Service

100 0 100 200 300 400 500 Miles

ALBERS CONICAL EQUAL AREA PROJECTION—STANDARD PARALLELS 29½° AND 45½°

Brown dots and brown lines indicate areas of labor surplus determined from local employment offices based on more recent data than that used in "Area Labor Market Trends" of January 1961. They also include areas of smaller labor force than used in that report.

FOREST LAND MANAGEMENT

(1) An increase of $700,000 in timber sales administration and management would be used to increase the timber cut by 100 million board feet to a total of 10.1 billion board feet and advance sale preparation by one billion to three billion board feet. About $350,000 of the increase is needed for higher rates per thousand board feet in sale preparation and administration resulting primarily from anticipated smaller sized sales in western national forests. Following is a summary of the total program proposed for fiscal year 1962:

Regular Sales:		
Sale preparation	11.1 billion feet at $0.51 per M	$5,661,000
Sale administration	9.6 billion feet at 1.35 per M	12,952,000
Advance sale preparation	3.0 billion feet at 0.23 per M	690,000
Special small and salvage sales (sell and cut 510 million feet)		1,172,000
Timber inventories and management plans		1,820,000
Total		22,295,000

(2) An increase of $5,100,000 for reforestation and stand improvement. Estimates indicate that the sustained yield of timber from the national forests must be increased gradually over the next 40 years to an annual output of 21.1 billion board feet, over twice the present cutting rate. This increased cutting is the national forest share of the 105.4 billion board feet which needs to be produced annually by the year 2000 from Federal, State, and private forests to meet demand arising from expected population and economic growth trends. The national forest share can be met only if idle lands are reforested and if crowded, stagnated young timber stands are thinned and otherwise converted into productive forests. Since forestry is a long-term process it is essential that action be stepped up now to meet anticipated needs several decades hence. It is estimated that three-fourths of the 4.4 million-acre backlog of nonstocked and poorly stocked old burns and other areas on the national forests needs to be reforested in the next 10 to 15 years; and that the productive condition of 11 million of the 30 million acres of young growth needs to be improved by weeding, thinning, and other measures in that same period. The increase would be used as follows:

a. Reforestation Items	Estimate, 1962
Construction of new nurseries (Idaho, Colorado, and one in California)	$850,000
Expansion of existing nurseries (California, Minnesota, Oregon)	75,000
Expansion and betterment of existing nurseries (California, Oregon, and Mississippi)	100,000

a. Reforestation Items--continued	Estimate, 1962
Construction of new seed extractories and seed storage units (Louisiana, Idaho, and Colorado)	200,000
Field planting and seeding an estimated 40,000 acres	1,375,000
Advanced ground preparation for planting or seeding, 6,000 acres	200,000
Measures to obtain natural reproduction (discing, burning, furrowing)	75,000
Care of existing plantations and natural reproduction	175,000
b. Stand Improvement Items	
Release of natural and planted stands on an estimated 130,000 acres	1,410,000
Thinning of overdense stands on an estimated 25,000 acres	600,000
Pruning young stands to improve timber quality on an estimated 3,000 acres	40,000
Total increase	5,100,000

(3) An increase of $3,400,000 to accelerate progress on the recreation program on the national forest system. Sanitation, care, and maintenance at existing recreation areas would be improved in order to properly accommodate the increased use (1960 use was 13% over 1959). The rehabilitation program, designed to put all existing sites in standard condition, would be stepped up by rehabilitating 10,780 individual family camp and picnic units, and other facilities such as bathhouses. The program to reduce serious overcrowding of recreation areas would be furthered by the construction of 1,720 new family units and other sites which will increase the capacity to handle 1-1/2 million more visits per season. Due to increasing demands, greater emphasis is being placed on the development and administration of outstanding recreation sites such as Flaming Gorge, Madison River Earthquake Site, Mendenhall and Portage Glaciers, Shasta and Trinity Reservoirs, Current and Five Point Rivers and Cumberland Reservoir. At such sites there is need for more public services, including an interpretive program, and for boat landings, bathhouses, overlooks, visitor centers, and other facilities which are not measurable in terms of family units. There is also a great need to repair a number of recreation dams so as to make them safe, and to provide aides and policing, and urgently needed development of campgrounds, picnic and other sites in the new

Winema National Forest, created largely from the former Klamath Indian Reservation in Oregon which heretofore has had no public recreation developments.

(4) An increase of $1,150,000 for wildlife habitat management would be used as follows:

(a) $400,000 to conduct fish and wildlife habitat inventories; increase technical leadership and training in coordinating wildlife habitat management with other national forest activities; and expand cooperative Forest Service-State game and fish department wildlife and wildlife habitat management activities.

(b) $750,000 to maintain and improve food, cover, and water and sportsman access as follows:

Revegetation of 21,000 acres of key wildlife areas through direct planting, release cuttings, fencing, etc.	$290,000
Construction of 330 small water developments, 115 wildlife study enclosures, 50 short parking spurs and boat ramps, and 30 flow maintenance dams	195,000
Stabilization of banks, removal of barriers, and protective fencing on 70 miles of fishing streams	100,000
Stabilization of banks and water levels, fertilization, rough fish and debris removal on 6,500 acres of lakes	65,000
Create and maintain 5,000 acres of new wildlife openings and "walkways"	100,000

(5) An increase of $500,000 for range resource management. About $380,000 would be used to gather more accurate knowledge of range conditions and trends and reliable estimates of grazing capacity through increased efforts in range allotment analysis. Although analysis work has progressed steadily, with about one-third of the total task complete for the more than 11,000 grazing allotments as of the end of fiscal year 1960, completion of the task on all allotments in a reasonable length of time is highly contingent upon additional funds. In fiscal years 1959 and 1960, analysis and plans work was carried out for the equivalent of 1,653 allotments, or 826 allotments each year. Stepping up this rate of accomplishment by 245 allotment equivalents annually to around 1070 allotments is needed to complete the analysis task concurrently with meeting resource needs and management responsibilities.

About $60,000 would be used for application of range management plans, with the remaining $60,000 used for re-appraisal work on completed allotments and for establishment of demonstration allotments under systems of rest-rotation or other rotation plans to foster good range management in coordination with use of other forest and grassland resources. In addition, this increase would provide for control of rodents, insects, and poisonous or noxious plants which is needed to remove nuisance or threat to agricultural or farm lands.

(6) An increase of $550,000 would be used for revegetation of depleted Forest Service rangelands. This increase will shorten the time needed to get rangelands back into good forage production and watershed condition using proven materials, machinery, and methods. It would permit the treatment of about 55,000 acres of depleted rangelands.

(7) An increase of $550,000 would be used for installation and maintenance of needed range improvements and maintenance of existing improvements. Thirty-four thousand miles of fence and an additional 20 thousand water developments are urgently needed to fully implement the Forest Service's plans for the rangelands under its administration. The increase would finance approximately 230 miles of fence and 180 water developments, with about $160,000 of the increase used for maintenance of improvements.

(8) An increase of $1,200,000 for soil and water management to accelerate the restoration of damaged watersheds and to aid in maintaining or enhancing existing acceptable watershed conditions. Land treatment measures will be applied to approximately 12,000 acres to reduce sheet and gully erosion and to stabilize some 400 miles of eroding stream channels and abandoned roads. Increased attention will be given to measured water yield improvement on selected watersheds where water supply is a dominant feature of multiple-use management. Soil surveys will be accelerated and needed soils management interpretation will be provided to a larger number of land management projects.

(9) An increase of $1,200,100 for mineral claims, leases, and other land uses. This item covers six land administration activities, each of which is handled as an identifiable program, and each of which is an essential part of a balanced program. The six items are: (a) mineral claims administration, surface rights determination, mineral claims and leases; (b) special land use administration; (c) land exchange and land ownership adjustment; (d) land status records; (e) land classification activities; and (f) land line locations. The increase would be used as follows:

(a) $220,000 to bring the administration and supervision of mineral leases, mining claims, and special uses up to more satisfactory standards (items a and b above). These activities, which vitally affect the management of the national forest system under the principles of multiple use, have long been underfinanced, and a higher standard of management is urgently needed. Specifically involved are:

Supervision of the issuance and operation of mineral leases on acquired and public domain lands administered by the Forest Service. Such leases cover over 13 million acres and receipts credited to the national forest system are over $1,250,000 for acquired lands, and an estimated $8,000,000 is collected by the Bureau of Land Management for public lands administered by the Forest Service. It is essential that careful thought be given to multiple use management before leases are issued, and to protection of the surface resources from the mining operation. The Forest Service acts on acquired land leases and advises the Bureau of Land Management on public domain leases. This work often

requires extensive field investigation and negotiations with applicants regarding stipulations necessary to protect government-owned land and resources.

Status records showing the mineral ownership on some 20 million acres of acquired lands. Some of these minerals are very valuable and it is necessary to have accurate ownership records so that the property of the United States may be fully protected. This work often requires careful and time-consuming search of title records. It may also involve litigation.

Supervision of operations on privately-owned mineral rights on lands where the United States owns the surface. Millions of acres of acquired lands are involved and it is necessary that the surface rights of the United States be protected from operations by the owners of privately-owned minerals, so that unauthorized destruction of land and resources may be prevented.

Investigation of several thousand occupancy problems connected with mining claims so that unauthorized uses and occupancy may be terminated.

Closer supervision of the 58,000 special use permits under which many varied private uses are permitted on national-forest land. Special use permits have increased steadily at about 2% per year. Revenues from these uses amount to over $1,300,000. Close supervision is necessary to insure that these uses are properly coordinated with the management objectives of the national forests.

In addition to this increase it is planned to finance some of the continually increasing mineral and mining claim activities such as mining claim trespass, technical examination of claims for patent applications, leasing of minerals, and the valuation of mineral resources with appropriated funds made available for determination of surface rights of mining claims pursuant to the Act of July 23, 1955 (Public Law 84-167). This will be done as required by the changing job load for the latter activity.

(b) $290,000 for carrying on an accelerated program of land exchange and land ownership adjustment, initiated in fiscal year 1958, to consolidate and adjust the national forest ownership pattern for more efficient and economical administration. Studies of land adjustment needs indicate some 1-1/2 million acres of national-forest lands should be exchanged.

With this increase, it is planned in fiscal year 1962 to consummate negotiations on pending exchanges involving approximately 150,000 acres of land to be conveyed by the United States and about an equal acreage of lands to be received by the United States. It is also planned to conduct initial negotiations and to appraise and report on an estimated additional 500,000 acres of land. This will increase, by at least 50%, the rate of accomplishment possible under the current financing.

(c) $170,000 for land status records. Land ownership and land status records are inadequate to meet the needs of field officers in protecting the interests of the Government and in planning for expanding national forest resource uses. A revised records-keeping system has been developed and is being pilot-tested in two regions. It is almost ready for installation in all Forest Service regions. The increase will expedite this installation and provide for current maintenance of such records as installed.

(d) $105,100 for land classification. Population and land values have increased in all national forest localities. Uses of and demands on wild lands are increasing. Land uses change as do economic conditions in related areas. These factors require that the Forest Service give close study to the complex problems related to defining areas that might better serve the needs of the nation if excluded from or included in the national forest system. These problems, related to changing populations, changing land use patterns, varying economic and social needs and demands and resource conditions, require continuing attention to establish and keep up to date appropriate policies and guidelines. It is planned that a small staff addition, at regional and key forest levels, would be made to meet this need.

(e) $415,000 for accelerating the land line location program initiated in fiscal year 1958 to search for, properly identify, and perpetuate property and other land line courses; to obtain proper re-establishment of "lost" corners; and to survey and mark property lines between national forest and non-Federal lands. Increased land values, land uses, and other ownership factors make it imperative that this work be speeded up. With this increase the fiscal year 1962 objective will be to examine and evaluate 24,000 corners, monument and record 8,000 corners, and survey, mark, and paint 400 miles of property lines.

(10) An increase of $3,100,000 to strengthen the basic fire control organization, which must be done to reduce the high cost and large losses of valuable resources of the disastrous fires of the past two years. This increase will be a material move toward meeting the needs of adequate protection on the national forests. This would add to the permanently-financed air-attack program for dropping retardant chemicals by providing additional tanker bases and move firmly in staffing a number of bases now in use in western States. The increase would strengthen the fire-prevention program in response to the problem of an increasing number of man-caused fires and the marked buildup in use of the forests. The program would include new development and adaptations of present equipment, particularly for the application of retardant chemicals. Initial attack would be strengthened by additional small crews, totaling about 600 men and 12 helicopters (under commercial contract), for rapid attack on small fires to keep them from reaching large size. Five larger highly mobile crews would be provided for rapid air transportation throughout the West to reinforce fire-fighting forces when initial attack fails. This increase would also make it possible to better meet the protection needs of 525,679 acres of Klamath Indians forest land which is in process of becoming national forest land.

(11) An increase of $1,927,000 in structural improvements for fire and general purposes would be used:

(a) To step up the level of maintaining improvements by $650,000. This will bring financing of the total estimated maintenance cost of $5,600,000 to about 90% of annual needs compared with the current level of about 78%.

(b) $1,098,000 along with $5,415,000 of currently available funds, or a total of $6,513,000, would be used to construct about 120 housing units plus urgently needed service buildings, related improvements, and communication systems. This includes $300,000 to complete the air-to-ground radio communications for forest fire control operations.

(c) $179,000 for leasing of new office space needed for expanding program activities at some 25 locations. At these locations the General Services Administration does not have available space facilities and would have to contract for the additional space. In keeping with Bureau of the Budget instructions, the added funds for the new space requirements which result from expanding Forest Service programs are proposed as an increase to this program appropriation, rather than as an appropriation increase to GSA. After the new leases are negotiated and the space occupied, it is contemplated that fund transfers will be made to GSA and thereafter that agency would be responsible for providing the space and securing continuing appropriations therefor. This assumes approval of the authority for such transfers proposed in the 1962 Budget estimates for GSA.

(It is also planned to use $30,000 of available funds for additional improvements at the Aerial Fire Depot at Missoula, Montana. The act of October 24, 1951 (Public Law 198) authorized an appropriation of $970,000 for acquisition of land and construction of a fire control smoke jumper headquarters, air cargo supply base, and other facilities at Missoula, Montana. The Third Supplemental Appropriation Act, 1952 (Public Law 375), approved June 5, 1952 appropriated $700,000 for these forest fire control facilities but specified that this amount should be the full cost of land and construction of facilities contemplated by the act of October 24, 1951.

Subsequent to the construction described above, additional needs for buildings and other facilities at Missoula have developed. It is planned, in fiscal year 1962, to use about $30,000 of total available funds primarily for construction of additional airplane taxiways and service facilities for the aerial fire depot at Missoula, Montana.

There will be similar needs in future years to meet the expanding aerial fire control program including the use of fire retardants. This would involve such items as mixing plants and storage facilities for fire retardants, additional storage and office space, airplane hangar, supplemental well and water system, radio station and repair shop, and other related facilities. The Service plans to finance such future developments from funds appropriated for "Structural improvements for fire and general purposes" and under the appropriation language authority for "purchase, erection, and alteration of buildings and other public improvements.")

(12) An increase of $2,150,200 for control of spruce budworm in Montana, Idaho, Colorado, New Mexico, and Minnesota, and for control of jackpine budworm in Minnesota, Michigan, and Wisconsin.

The original 1962 budget provided $530,000 for budworm control, and the justifications indicated that this amount was substantially below estimated needs. The revised budget provides an additional $2 million. This amount plus the $530,000 contained in the original estimate would be used for control of spruce budworm ($2,430,000) and jackpine budworm ($100,000) as outlined below.

(a) Spruce budworm is epidemic on some 8 million acres of fir and spruce forests along the Continental Divide of the Rocky Mountains from Montana to New Mexico and on 2 million acres of balsam fir and spruce in northern Minnesota. Surveys in the fall of 1960 disclosed the budworm situation on 1.8 million acres to be sufficiently serious that control to avoid heavy mortality and growth losses would have been desirable in the spring of 1961. Because other urgent infestations required treatment with funds then available it was decided to defer control on budworm projects until the spring of 1962. Because control was deferred it now becomes urgent to treat the 1.8 million acres plus about 600,000 acres into which the infestation probably will spread. Timber values estimated at $33 million are threatened by these attacks.

The following control projects are planned:

(1) Montana--on Deerlodge, Helena, and Lewis and Clark National Forests	$500,000
(2) Idaho--on Challis and Salmon National Forests	300,000
(3) Colorado--on Pike, Rio Grande, and San Juan National Forests	630,000
(4) New Mexico--on Carson and Santa Fe National Forests and Navajo Indian Reservation	800,000
(5) Minnesota--on Superior National Forest	200,000
Subtotal	2,430,000

Most of the timber infested with spruce budworm is Federally owned. State and private participation in control on such interspersed and adjoining lands is anticipated.

(b) Jackpine budworm in Minnesota, Wisconsin, and Michigan. Control is needed on 90,000 acres of infested plantations and natural stands of jackpine. An estimated 310,000 cords of pulpwood valued at $1.8 million is threatened by this epidemic.

The following control projects are planned:

(1) Minnesota--Chippewa National Forest (mostly Federal lands)	35,000
(2) Wisconsin--Chequamegon National Forest and including a cooperative project on state and private lands	50,000
(3) Michigan--Upper Michigan and Ottawa National Forests and adjoining private lands	15,000
Subtotal	100,000

Participation of State and private owners in control on non-Federal lands is anticipated.

FOREST RESEARCH

(13) A net increase of $1,000,000 in Forest and range management research is made up of:

Increase for specific research programs ...	$1,400,000
Decrease in non-recurring portions of the emergency research program on the San Dimas Experimental Forest	-400,000
Net increase	1,000,000

The program increase of $1,400,000 would consist of the following:

(a) An increase of $600,000 for forest management research would be applied to problems of intensified timber management where the need for such work is the most pressing. To accelerate progress in the reforestation of the millions of acres of brushfields and poorly stocked forest land, research on the control of brush would be expanded, with emphasis on the physiological action of chemical herbicides in relation to kinds of brush and time of application and on other methods of site preparation. To further insure success of reforestation, research would be increased on the control of damage to young trees by animals, and would be aimed particularly at the development of systemic repellants and at the manipulation of forest vegetation.

Additional research would be directed at developing better methods of sampling and measuring natural and intensively managed timber stands in order to estimate gross growth and potential losses, information needed in the development of stepped-up timber production programs.

Forest genetics research, designed to make new and better trees available for forest managers, would be expanded at the three forest genetics institutes. Special attention would be given to techniques of vegetative propagation, evaluation of new hybrids and the potential of selected superior trees, and factors affecting reproductive processes.

Research would be strengthened to provide information leading to improved forest practices in such forest regions as Alaska, the true fir types of the west, the shelterbelt area of the midwest, the extensive pine plantations of the south, and mountain hardwood forests in the east.

(b) An increase of $310,000 for range and wildlife habitat research would be used mainly in the west to strengthen both basic and applied research on range problems of domestic livestock and big game. Development of improved cattle and sheep grazing management practices for high range-watersheds of the western national forests would receive special attention. Studies of improvement and management of brush infested ranges in California and Arizona would be strengthened along with methods for managing cut-over areas to provide optimum conditions for both forage production and establishment of timber reproduction. Also research on management of annual vegetation on ranges in Idaho and California would be given increased

emphasis. Site evaluation and type conversion studies would be strengthened in Missouri. Methods for improving food and cover on key wildlife areas and for managing wildlife habitat would be studied in the Lake States, south and the southeast, particularly the phases dealing with an attempt to gain better integration of wildlife and timber production.

(c) An increase of $155,000 would be used to strengthen forest recreation research. Special emphasis would be given to studies leading to better management and improvement of forest camp grounds, as well as prevention of damage to forest areas subject to heavy public use. Also included would be studies to determine carrying capacity and optimum distribution of use in wilderness areas; on development of techniques for measuring and classifying forest recreation use, and coordination of such use with timber, forage, and water production. Studies relating to services and charges for recreation facilities and projection of future demands for forest recreation would be strengthened.

(d) An increase of $335,000 would be used on watershed management research. This increase would provide for some strengthening of watershed management research in each major forest region with emphasis on the most pressing problems. Some of the studies would deal with problems of how to carry out logging on moderate to steep slopes without causing serious soil erosion and impairment of quality of water yield. Other studies would be concerned with how different patterns of timber harvesting affect timing and quantity of water yield with the object of increasing such yield in harmony with good forest management practices. Research leading to the protection of soil and water values during coal and other strip-mining operations in the Appalachian Uplands would also be expanded and would include improved methods of rehabilitating mined areas following the extraction process. Studies would also be strengthened in wetland forest areas of the coastal plain in the Southeast to develop methods of controlling surface and subsurface water and thereby improve the soil productivity.

(e) A decrease of $400,000 in non-recurring portions of the emergency research program on the San Dimas Experimental Forest, southern California, which was started in fiscal year 1961 with a supplemental appropriation of $500,000. To continue this program, in subsequent years, will require $100,000 annually for measuring, recording, and analyzing the effects of the experimental treatments which have been started, in terms of soil erosion control and flood hazard reduction, improved water yields and reduced fire hazard.

(14) An increase of $320,000 in <u>forest fire research</u> would be used to strengthen basic laboratory and field studies of forest fire behavior as affected by different combinations of current weather, fuels and topography. Such research would lead to improved guides for quickly evaluating local fire conditions, deciding on the action needed to meet the impending fire threat with minimum costs and losses and preventing loss of life. Research in fire fighting methods would be expanded with strong emphasis on techniques and devices to help ground firefighters control at small size

those fires that now defy attack and escape to become conflagrations. Stronger emphasis would also be placed on development of aerial fire-fighting techniques and study of improved firefighting chemicals as well as other new systems. It would also speed basic research on the formation of lightning storms and methods for dissipating them to reduce the number of fires caused by lightning. More effective means of assuring speedy discovery of fires by radar, electronic techniques, and other new principles would be studied.

(15) An increase of $425,000 for forest insect research would be used to strengthen programs of basic and applied research on the prevention or control of destructive forest insects in each of the major forest regions of the country, including Alaska. Emphasis would be placed on studies of biological control factors, including insect parasites, predators, and insect-pathogens. Environmental factors that may be conducive to the development of outbreaks or their prevention would also be studied. In the West and South, greater efforts would be placed on studies of the biology, ecology and control of bark beetles and defoliating insects, and on insects destructive of the seeds and cones of trees. Because of the expanded tree planting program in the eastern half of the country, studies would also be strengthened on insects that cause deformation and damage to forest plantations in the East, South, and mid-West. Studies would be expanded on insects that seriously degrade hardwoods in the South and mid-West; and on insects destructive of forest products in the South.

(16) An increase of $425,000 for forest disease research would be used:

(a) To intensify research leading to control of fusiform rust, currently the most serious disease of southern pines.

(b) To expand research on Fomes annosus, a root rot fungus that has only recently assumed dangerous proportions in coniferous plantations. So far damage from this fungus is concentrated in the South and Northeast but it is potentially capable of threatening the success of reforestation and afforestation programs nationwide.

(c) To strengthen research on the ecology and interrelations of forest soil micro-organisms. Such information is basic to determining the causes of root diseases and the development of methods of controlling them. These are especially destructive to coniferous forests.

(d) To conduct basic research on little-understood vascular diseases which are particularly damaging to hardwood species and are now largely uncontrolled.

(e) To initiate basic research on the physiology and use of antibiotics and other systemics for control of forest tree diseases, especially the rusts and dwarfmistletoes of conifers.

(f) To strengthen the program of developing white pine trees with inherent resistance to blister rust, their most damaging disease.

(17) An increase of $950,000 for forest products utilization research including related engineering research would be used as follows:

Forest Products

(a) Timber Quality, $130,000. To accelerate research at the Forest Products Laboratory and the regional forest experiment stations on the development of criteria for expressing the quality of trees, logs, and bolts so that such products may be segregated by quality grades for their highest use. Also included would be the development of a method for automatically testing the strength of structural lumber so that full use of the material may be made in accordance with its rated strength and associated structural safety requirements.

(b) Solid Wood Products, $260,000. For basic and applied research at the Forest Products Laboratory needed to improve present manufacturing processes and to develop new uses for wood in solid form. Included are gluing processes for products using wood alone or for wood in combination with metals, plastics and fabrics. Also for developing better drying methods for lumber and veneer, especially for the more difficulty-to-dry woods; and better methods for cutting wood to increase its utility and value.

(c) Structural Uses, $220,000. For work at the Forest Products Laboratory to increase structural efficiency of wood and thereby extend its use by developing better design factors for wood structures, including laminated beams and arches, timber bridges and stressed shapes; also to improve design criteria for crates and other kinds of wood packaging.

(d) Pulp and Chemical Products, $240,000. For basic research at the Forest Products Laboratory in wood chemistry and physics leading to new and improved conversion processes for low-quality hardwoods and little-used species through large-scale production of industrial chemicals, better methods of utilizing hardwood fibres, and ways of utilizing mill residues.

Proposed distribution of the above increases:

For work at the Forest Products Laboratory	$780,000
For work at the regional forest experiment stations ...	70,000
Total	850,000

Forest Engineering

(a) Forestry Equipment, $100,000. For research at the regional experiment stations to advance the mechanization and efficiency of forestry operations; to develop and evaluate machines and similar equipment for such operations as logging, planting, timber-stand improvement, and protection of forests. Special attention will be given to devices and methods for logging erosible watersheds now considered inoperable.

(18) An increase of $350,000 in forest resources research would be used for economics and marketing research to develop improved forest management and forest products marketing opportunities for the small forest landowners whose problems represent a critical aspect of the country's future timber supply. This research would include studies leading to improved processing practices in small forest industries that can be developed in areas of lower quality timber supply and thereby extend the demand for raw material. It would include development of better systems of marketing various timber products, particularly in low-income forest areas such as the Appalachians and northern Lake States to enhance the returns to small owners. The research would also provide information and guides to more efficient marketing practices by existing small businesses producing lumber and other forest products, and by potentially new industries in rural areas where timber market development is needed. Research would also include stronger emphasis on development of economic guides to tree planting, stand improvement, and other timber growing practices. In areas such as the Southwest, studies would be made of the impact of timber growing, grazing, and other practices on water yield and soil stability in order to develop better guides to a balanced and integrated forest resource development program on national forests and other lands.

(19) An increase of $1,030,000 in research construction would be used for the following structures and facilities:

(a) Wenatchee, Washington

Forest soils and hydrology laboratory $300,000

This laboratory would provide the additional space required for the research program at this location and the facilities for a more thorough and basic approach to problems of soil and water management in the forests of the east slopes of the Cascade Mountains and adjacent areas. The research program involves study of the extent, pattern, sources and causes of erosion and consequent sedimentation, an essential step to correction of undesirable conditions on deteriorated forest watersheds. It also involves study of plant-water relations, and of the effect of micro-environment on water use by plants, information required for design of practices that would permit conservation of available water from forest and range lands. A suitable site adjacent to a branch of the State Agricultural Experiment Station is now being purchased.

(b) Moscow, Idaho

White pine disease and silviculture laboratory 300,000

This facility is needed to support the research program for the western white pine forests of the northern Rocky Mountains. Principal emphasis is upon basic research in genetic improvement of white pine, including the development of strains that are resistant to blister rust and that have other desirable

characteristics. Also included is study of other diseases affecting white pine and its associated species and the use of antibiotics in disease control. Silvicultural research is aimed at obtaining knowledge leading to intensive practices to meet the needs of forest managers in establishing and tending forest stands. Much of this work requires modern laboratory facilities and equipment and space not now available. Because of lack of facilities this program now is split and is quartered at two separate locations. This building would permit consolidation and resultant increased efficiency of the entire effort. It would be located on the campus of the University of Idaho where excellent cooperative relations are now maintained. A building site would be provided by the University.

(c) Bottineau, North Dakota

Plains shelterbelt laboratory $130,000

This laboratory would provide badly needed facilities for research in the establishment, care and protection of shelterbelts to protect the northern Plains area from erosion caused by wind and to benefit crop yields. Because of the severe climate prevailing over much of the Plains region, intensive study must be made of the adaptability of different species, of their soil and water requirements, and of special planting techniques necessary for successful seeding establishment and growth. Research must also be directed at preventing and controlling losses from insects and disease, both in the tree nurseries and after the seedlings have been planted. Negotiations are under way with the North Dakota School of Forestry for lease of a site for this building.

(d) Madison, Wisconsin

Preplanning for expansion of Forest Products Laboratory and acquisition of site 300,000

The research program in the short-term program for the national forests includes plans for expanding the facilities of the Forest Products Laboratory to provide space for additional research in pulping, wood chemistry, wood fabrication processes, structural uses, timber quality and other problems leading to better utilization of the nation's timber resources. A new structure would be built adjacent to the present Laboratory building on land acquired at nominal cost from the University of Wisconsin. Since the new laboratory building would require extensive planning and careful development of engineering and mechanical specifications, a preplanning project is proposed. With the funds suggested, the Forest Service would

obtain architectural and engineering services to develop sound plans so that the proposed construction could be expedited when building funds are made available.

Additional forest research construction.--In fiscal year 1961, $1,075,000 was provided for Forest Research construction as follows:

(a) Corvallis, Oregon	
Laboratory for forest insect and disease research ...	$350,000
(b) Durham-Raleigh, North Carolina	
Laboratory for forest insect and disease research ...	350,000
(c) Stoneville, Mississippi	
Laboratory for bottomland hardwood research	300,000
(d) Marquette, Michigan	
Office-laboratory for northern hardwood research	75,000
Total	1,075,000

In fiscal year 1962 this amount will be used for the following needed facilities for Forest Research:

(a) Riverside, California

Laboratory for research on forest fire control problems of the Pacific Southwest 975,000

This laboratory will provide facilities not now available for present programs in California and will permit centralizing research now under way at several locations. The facility will provide laboratories for the conduct of basic research on combustion as related to the highly inflammable southern California brush fields. Facilities for study of aerial fire control methods and equipment will be provided along with specialized facilities for the study of fire weather phenomena that have special significance to the California fire problem and that of other Pacific Coast States. The laboratory, located adjacent to the Riverside Campus of the University of California, is also near the University of California at Los Angeles, University of Southern California, California Institute of Technology, and other outstanding educational and research institutions with which the Forest Service now has or expects to have strong cooperative programs in the field of forest fire control and related physics, chemistry, and engineering research. Specialized equipment, necessary to a program of fire research, is available on a cooperative basis at these institutions and will not be duplicated in the proposed fire laboratory.

(b) West Thornton, New Hampshire	
Laboratory facilities for forest watershed research in the northern hardwood forest type of the Northeast	50,000
(c) Grand Rapids, Minnesota	
Greenhouse and headhouse research facilities	25,000
(d) Gulfport, Mississippi	
Insectary structure and facilities for forest insect research ($10,000); garage and storage ($10,000); construction of experimental nursery ($5,000)	25,000
Total	1,075,000

STATE AND PRIVATE FORESTRY COOPERATION

The increase of $3,600,200 for State and private forestry cooperation is composed of:

(20) An increase of $2,554,000 for cooperation in the control of forest fires on State and private lands in 48 States.

Need for Increase.--The hazards and risks of fire on State and privately owned lands have assumed great significance because of widespread timber harvesting, increased tree planting, demands for potable water, the increase in recreational demands and the move of population to suburban living. Exclusive of the proposed 105 million acres to be patented to Alaska, State and private forest and related lands total 435 million acres. These lands produce 85 percent of our forest products and play a key role in the Nation's timber supply.

Forest land values have increased from $2 or $3 per acre to $15 to $35. More than a million acres of such lands are being planted to seedling trees each year at a cost of $10 to $30 per acre. Fires menace and destroy these values.

The movement of people to settle in wooded areas has increased the risk from fire. Debris burning always a major cause of forest fires was the number one cause in 1959. It is again high among causes in 1960.

Recreational use of State and private lands is an important part of our economy and the trend in use is upward. Forest recreation is particularly important near centers of heavy population.

Hundreds of millions of dollars are spent to impound, control, distribute and purify water for industrial, agricultural and urban use. The forested watersheds which supply the water to expensive installations have an important effect upon the efficiency and life of such facilities. Thirty-four Eastern and Pacific Coast States contain 87% of our people and produce 95% of the value of all goods of U.S. manufacture. About one-half of the rural watersheds for the water of these 34 States is forest land.

An effective, well-equipped fire control organization is needed to protect the important natural resources on State and privately owned lands and to combat increasing hazards and risks. During the past five years the States reported an average of 105,672 fires which burned 4,608,200 acres a year. State Foresters estimate that the adequate protection of all non-Federal areas (excluding Alaska and Arizona) will cost not less than $83 million. In fiscal year 1960 the States spent $56 million including the $10 million of Federal funds. An estimated $27 million is still needed to provide an adequate level of protection. There is need for the stimulus of added Federal funds to insure effective programs in all States, but particularly those with recently initiated programs.

Plan of Work.--The proposed $2,554,000 increase will be allocated to the 48 States now participating in the Federal-State cooperative fire control program and will be used to:

1. Extend organized protection to approximately 6 million acres of the 34 million acres of forest land which are currently unprotected in 15 States. Fire records indicate that the percent of acreage burned on unprotected areas is more than 10 times greater than under organized protection. We must plug the losses of timber resources on unprotected areas by giving them organized protection.

2. Provide more intensified protection to the 200 million acres of forest land now receiving less than adequate protection (no estimate for Alaska). Despite the adoption and use of modern fire fighting equipment and techniques, 77,802 fires burned over 1,681,000 acres of non-Federal forest lands in 1959. The proposed increase would aid the States to provide the additional manpower, fire tools and equipment together with fire towers, fire trails, fire headquarters and stations to reduce the fire losses. Added funds would aid Alaska, Arizona, Nebraska, North Dakota and Wyoming in getting their programs more effectively under way.

3. Reduce the number of man-caused fires. Fire statistics reveal that over 97% of all fires occurring on non-Federal lands are man caused. State Foresters co-sponsor "Smokey Bear"and other fire prevention campaigns, but additional funds are needed to intensify these efforts. Funds are needed to provide State fire prevention efforts at the local level. The increased Federal funds will assist in doing these things.

(21) An increase of $946,000 in cooperative forest management for additional cooperation in providing technical assistance to private woodland owners and primary processors of forest products.

Need for Increase.--Under the Cooperative Forest Management Act Program, the States with the aid of the Federal Government are attempting to improve the management of the most important segment of the Nation's forest resources and industries. This is the area in small woodlands -- about 265 million acres which represent three fourths of the privately owned commercial forest land -- and about 50,000 small forest industries. Dealing with this problem is difficult because it involves some four and a half million owners. The urgent need for action has been emphasized in the Timber Resources Review -- the latest national survey of the nation's timber situation. This survey reports that small ownerships must provide about half of the timber supply in the future and to meet expected demands for sawtimber, growth on small woodlands must be increased by 100% by the year 2000 if the Nation is to enjoy about the same per capita timber consumption it does today. Advances made in forest management practices on these small ownerships are far below those on larger private and public ownerships. At a series of 25 woodland owners' meetings held throughout the Nation ending in 1959 to ascertain the needs of these owners, one of the most frequent recommendations was for technical forest management assistance of the type provided by the Cooperative Forest Management Program.

The States have set an excellent record in organizing to provide the necessary technical help to private woodland owners. From a start of 9 or 10 foresters in 1940 the program has grown and now some 550 foresters are available to provide forest management assistance. This, however, is not nearly enough to do the job, for less than 40,000 owners annually are receiving adequate assistance and an additional 40,000 are receiving some help but not enough. Very little has yet been done to help the small processors. About nine tenths of all the sawmills are so small and inefficient that they produce only about 1/4 of the Nation's lumber.

State appropriations accounted for $2,902,000 or about two thirds of the $4,444,000 total program cost for fiscal year 1960. Although the States have steadily increased program funds the demand for services is far beyond the capacity of the program to supply. Additional Federal funds will assist the States in meeting this demand.

Plan of Work.--The proposed $946,000 increase will provide a total of $2,500,000 of Federal funds -- the full authorization recommended by Congress in 1950. The increase will make possible extending the program to parts of the States not now covered and also provide a general intensification of the work. States will share in the increase on the basis of a formula which takes into account need, based upon number of small woodland owners, and performance, based upon the State's record of financial contributions to the program in excess of the Federal funds.

The proposed increase, when matched by the States, would provide an additional 225 service foresters, who can assist an additional 32,000 owners and processors annually. Special effort would be given to starting work with small processors and to the areas where unemployment and distressed economic conditions are prevalent.

(22) An increase of $100,200 in the general forestry assistance program, for specialized assistance to States, local governments, forest industries and other large forest landowners, and other Federal agencies administering forest lands.

Need for Increase.--More than half of the States have large underdeveloped rural areas. Most of these areas have privately-owned forest resources that are not contributing their share to the economic welfare of the community. The problem is to find a market for the quality of timber available, and process the timber as far as possible within the area, to create employment for local labor. These areas need help in preparing a prospectus showing opportunities for forest industries, based on the availability of continuous timber supplies.

The Forest Service is often requested to assist large landowners, consulting foresters, forest schools, State and other Federal agencies in highly technical forestry problems. Developing new and advanced forest management techniques and solutions to unusual forest management problems are a part of the general forestry program. An example is the assistance given to the University of Massachusetts in conducting a short course in Continuous Forest Inventory for private and public foresters.

Plan of Work.--About half of the increase would be used to employ forest industry specialists who would concentrate on making analyses of resource and industrial potentialities and upon the promotion of new industries and the expansion of existing markets, in close cooperation with marketing and utilization specialists in the States. The other half would be used to expand present activities of specialized assistance to States, other Federal agencies, large forest landowners and others who seek information on new techniques and special problems.

CHANGE IN LANGUAGE

The estimates include a proposed change in the language of this item as follows (deleted matter enclosed in brackets):

> For expenses necessary for forest protection and utilization, as follows:
>
> * * *
>
> [During the current fiscal year not to exceed $100,000 of the funds appropriated under this heading shall be available for the acquisition of sites authorized by the Act of March 3, 1925, as amended (16 U.S.C. 555), without regard to any other limitation on the amount available for this purpose.]

This language change is proposed to delete from the appropriation "Forest protection and utilization" the provision for the acquisition of sites. New language is proposed to be included under Forest Service "General Provisions" covering acquisition of sites and is explained under that heading.

STATUS OF PROGRAM

FOREST LAND MANAGEMENT

National Forest Protection and Management

Current Activities: The purpose of this program is to manage, protect, and develop the national forests and national grasslands under multiple use and for sustained yield. Under these principles natural resources of outdoor recreation, range, timber, watershed, and wildlife are utilized in a planned combination that will best meet the needs of the Nation without impairing productivity of the land. These management and utilization principles were recognized in the Multiple Use-Sustained Yield Act of June 12, 1960 (Public Law 86-517, 74 Stat. 215).

Under the multiple-use principles practically all areas are used for, or serve, more than one purpose or objective. For example, about 50% of the area within the national forests of the continental United States serves five different purposes: (1) timber production, (2) watershed protection, (3) forage production, (4) wildlife production, and (5) recreation. An additional 28% serves four purposes in varying combinations. Of the remainder, 21% of the total serves three purposes with only one percent of the total reserved for one purpose exclusively, mainly campgrounds and special use areas, such as summer homesites, pastures, corrals, etc.

The varied interests which inevitably conflict and which must be reconciled, the vast areas covered, and the unusual complexities clearly require careful planning and skillful management of the national forest properties.

Protection from fire and trespass is made difficult by the large area to be protected, the general inaccessibility, the many thousands of miles of exterior boundary, and the impossibility of taking preventive action with such a problem as lightning-caused fires.

Gross area within unit boundaries encompasses about 226 million acres in 44 States and Puerto Rico, of which some 185.7 million acres are under Forest Service administration. Many tracts of privately-owned lands are interspersed within the Federal holdings.

The economic importance of the national forests and national grasslands will be realized when it is considered that:

a. They produced a cash income in the fiscal year 1960 of about $148 million. Approximately 65% of this amount is credited to the general fund in the Federal Treasury (miscellaneous receipts). The remainder is distributed in accordance with special acts of Congress including 25% to the States or counties in which lands are located, and 10% made available for construction and maintenance of the Forest Service system of roads and trails. In addition to cash receipts, there are the important non-monetary values of water, recreation, and wildlife.

b. The area within national forest boundaries is equivalent to some 10% of the area of the continental United States.

c. The national forests supplied 9.3 billion board feet in fiscal year 1960 to the nation's forest products industries. Dependence of the forest products industries on national forest timber continues to increase as the result of depletion of good quality timber on private lands.

d. About 6,000,000 head of domestic livestock (including calves and lambs) are grazed on national forest lands.

e. These lands provide protection to municipal water supplies for nearly all western cities and towns and many in the East, to irrigation water used on about 20,000,000 acres of western lands, and to many streams with water power developments. They provide flood protection to thousands of acres of rich valley lands and help to prevent more rapid siltation of reservoirs and stream channels.

f. They provide a habitat for a large part of the big game animal population, for birds, and for millions of small game animals and furbearers.

g. They provide opportunities for healthful outdoor recreation, with a minimum of restrictions, for the millions of people who yearly visit the national forests.

h. Nearly 4,000,000 people who live in and near the national forests are supported in whole or in part through the economic development arising through management and utilization of the forests and their resources.

The Forest Service, as a part of its regular programs, also directs Federal activities and provides technical guidance to States concerned with the prevention and control of fires which might be caused by an enemy attack in rural areas of the United States.

Selected Examples of Recent Progress:

Receipts

The following table summarizes cash receipts, showing actual for fiscal years 1959 and 1960, and estimated for fiscal years 1961 and 1962:

Class of receipts	1959 Actual	1960 Actual	1961 Estimated	1962 Estimated
Timber sales	$115,807,988	$139,904,172	$110,500,000	$147,000,000
Grazing	3,750,916	3,663,808	3,700,000	3,700,000
Land uses	2,588,652	2,780,245	3,000,000	3,200,000
National grasslands ..	1,919,236	1,864,336	1,700,000	1,700,000
Total receipts	124,066,792	148,212,561	118,900,000	155,600,000
Above amounts include:				
Suspense account, Alaska 1/.....	(587,944)	(747,761)	(800,000)	(1,000,000)
Suspense account, O&C Lands 2/.....	(2,713,891)	(4,544,826)	(3,200,000)	(3,800,000)

1/ Account established pending settlement of Indian rights on Tongass Forest, Alaska.
2/ Account established for Oregon and California railroad grant lands, for which receipts are transferred to Department of Interior for distribution under the Acts of August 28, 1937 and June 24, 1954 (43 U.S.C. 1181f-g).

Net area of lands under Forest Service administration changed from 185,805,378 acres as of June 30, 1959, to 185,772,049 acres as of June 30, 1960. This includes 3.8 million acres of land designated as National Grasslands to be permanently administered as part of the national-forest system and 488,198 acres remaining as Land Utilization Project lands as of June 30, 1960.

Timber Sales Administration and Management

The timber cut on the national forests in fiscal year 1960 reached an all time high of 9.37 billion board feet with receipts of $139.9 million. This exceeded the previous high (in fiscal year 1959) by over one billion board feet. Timber cut during the last quarter of fiscal year 1960, however, was slightly less than the last quarter of the previous year.

The volume of additional timber sold during fiscal year 1960 and placed under new contracts totaled 12.2 billion board feet compared to 9.4 billion in the previous year. The 1960 figure includes 3 billion board feet in a single sale of pulptimber sold previously but awarded in 1960 after the purchaser had qualified for final award in meeting the terms of a conditional award.

The above pulptimber sale was the 5th major sale of its kind made to foster plant installations for the utilization of heretofore unmarketable timber. These major sale accomplishments are summarized as follows:

Fiscal year of final award	Size of sale in billion board feet	Location	Remarks
1960	3.00	Snowflake, Arizona	Plant construction started. Estimated cost $40 million.
1958	5.25	Sitka, Alaska	$50,000,000 chemical pulpwood plant, operation started November 1959.
1955	3.00	Wrangell, Alaska	Sawmill now operating. Pulpmill not yet under construction.
1952	8.25	Ketchikan, Alaska	Pulpmill production fiscal year 1954.
*	7.25	Juneau, Alaska	See below.

* The 7.25 billion board feet sale of Alaska pulpwood has been conditionally awarded to Georgia Pacific Alaska Inc. Final award is contingent on plant construction by July 1, 1961. The 7.25 billion board feet has not been reported as sold and will not be so reported until final award has been made.

Lack of access roads and poor markets for some classes of timber products are some of the main factors contributing to the fact that full sustained-yield allowable cut of the national forests has never been harvested. Progress in meeting this problem is summarized below:

	Million board feet		
Fiscal Year	Annual Allowable Cut	Actual Cut	% of Allowable Cut Harvested
1956	9.1	6.9	76
1958	10.2	6.4	63
1960	11.0	9.4	85

As a result of disastrous forest fires occurring in calendar year 1959 in northern California, emergency steps were taken to shift from a normal timber sale program to a salvage program. The objective was to salvage fire-killed timber before it deteriorated and to remove it so it would not constitute a

fire hazard to unburned timber or a breeding ground for insects which might threaten remaining green timber. Emergency action taken was made possible by the willingness of timber operators to set aside normal operations and shift to salvage operations. As a result the following was accomplished:

Fire Salvage Sales--California Region

National Forest	Number of Sales	Volume Sold (thousand board feet)
Eldorado	15	93,454
Lassen	1	207
Mendocino	1	420
Modoc	1	4,300
Plumas	6	17,890
Sequoia	1	8,322
Shasta-Trinity	23	138,000
Sierra	5	18,038
Six Rivers	4	3,363
Stanislaus	4	12,520
Tahoe	24	131,076
Totals	85	427,590

Timber Inventories and Management Plans are an integral part of managing national-forest timber under the principle of sustained yield. The national forests are divided into 407 management units called "working circles" which vary in size from 33,000 acres to 1,703,000 acres of commercial national-forest land. Maximum allowable cut under sustained yield is computed for each working circle from resource inventories and such computations are incorporated in detailed management plans prepared for each unit. Re-inventories and revisions of management plans are programed so the allowable cut of each working circle may be updated approximately each 10 years. Each such updating reflects overall progress made in such things as fire protection, reforestation, industrial utilization, accessibility, and inventory techniques. Recent progress in updating annual allowable cut is as follows:

Fiscal Year	Sustained-Yield Allowable Cut
1956	9.1 billion board feet
1958	10.2 billion board feet
1960	11.0 billion board feet

Reforestation and Timber Stand Improvement

Fourteen Forest Service nurseries produced an estimated 143 million seedlings and transplants. Nursery expansion continued in the West, with two new nurseries operating in 1961.

Major accomplishments in tree planting and timber stand improvement work in fiscal year 1960 are shown by the following table:

Item	Treated Acreage (by fund sources)		
	Financed under Forest Land Management appropriation	Financed with deposits from timber sales 1/	Total
Planted and seeded	45,094	90,867	135,961
Measures to obtain natural regeneration (scarifying, burning, animal and rodent control) ...	17,425	25,345	42,770
Plantation release	31,859	14,443	46,302
Weeding, thinning, and cull tree treatment--natural stands	31,427	390,381	421,808
Pruning and crop tree release ..	3,601	86,372	89,973
Animal control	6,138	114,652	120,790
Rodent control (including porcupines)	495,662	13,394	509,056
Disease control (except blister rust control funds)	29,015	29,216	58,231
Insect control (except pest control funds)	2,682	5,437	8,119

1/ Funds collected from timber sale operators under the Knutson-Vandenberg Act of June 9, 1930 (16 U.S.C. 576b).

Recreation-Public Use

The national forests received three times as many visits for recreation in calendar year 1959 as in 1950. Nineteen million visits were made for picnicking, 13 million for fishing, 6-3/4 million for hunting, 5-1/2 million for camping, and 4 million for skiing and other winter sports. The rest were for swimming, hiking, riding, or just to enjoy forest environment. In all there were 81,521,000 visits in 1959, not counting those who simply drove through and enjoyed the scenery.

The record indicates that the strong growth trend in this important national forest activity will continue.

Calendar year	Recreation visits to the national forests
1950	27,368,000
1952	33,007,000
1954	40,304,000
1956	52,556,000
1958	68,449,000
1959	81,521,000
1960 (est.)	90,000,000

To provide for this increasing use, recreation sites must be cleaned, policed, and kept sanitary. Facilities must be maintained and worn-out ones rebuilt, and finally new facilities must be built to accommodate the increasing needs. Increased appropriations have made it possible to do an adequate job of cleanup, policing, sanitation, and maintenance of existing facilities. There are now 51,000 family units at national forest camp and picnic sites, 40% of which still need to be rehabilitated. Progress in rehabilitating worn-out facilities and building new ones has been appreciable. Thus far 20,000 family units have been rehabilitated and 8,700 new family units have been constructed. Existing recreation facilities are now being used 80% above their safe capacity. The most acute situations exist where new developments such as reservoirs and highways have brought crowds of recreation seekers to locations where no previous recreation use or facilities existed.

Wildlife Habitat Management

Each year the national forests become increasingly important as public hunting and fishing areas. Hunter and fisherman visits to the national forests in 1959 were 13-1/2 percent above 1958, and 307% greater than 1947. This is nearly 7 times the rate of increase in the nationwide sale of hunting and fishing licenses:

Fiscal year	Hunting and fishing license sales	% increase since 1947	National forest hunter and fisherman visits	% increase since 1947
1947	24,687,000	-	4,944,000	-
1951	28,688,000	16	7,755,000	56
1955	33,046,000	34	12,342,000	149
1959	35,000,000 (est.)	42	20,138,000	307

Increased appropriations in fiscal years 1957-1960 have permitted the addition of approximately 20 full-time wildlife specialists to the regional office or national forest staffs. In addition, the technical wildlife management activities were increased on all national forests with heavy wildlife workloads. On-the-job training, supervision, and leadership in methods and techniques for coordinating wildlife needs with other national-forest uses were emphasized.

State-financed habitat improvement projects involving 137,300 acres of national-forest land, 105 miles of stream, 73 forage study exclosures, and 783 small water developments were completed, maintained, or improved during fiscal year 1959. Forest Service participation in the planning, inspection, and control phases of these non-Federal habitat improvement projects has been strengthened. In addition, the Forest Service in fiscal year 1959 completed, improved, or maintained direct habitat improvements involving 49,770 acres of national-forest land, 20 miles of stream, 249 forage study exclosures, and 86 small water developments.

Cooperative work with the States on wildlife habitat surveys, studies, and plans was expanded. Thirty-seven wildlife habitat coordination plans, 12 intensive management plans, 10 statewide cooperative agreements, and 80 habitat improvement plans were prepared or revised during fiscal year 1959. Wildlife, food, water, and cover conditions were protected or improved on 1,880,000 acres of national-forest land through planned coordination with other resource management activities.

Range Resource Management

During calendar year 1959, the following numbers of livestock were permitted to graze on the national forests:

	Number	Animal months
Cattle, horses, and swine ...	1,116,995	5,508,401
Sheep and goats	2,565,381	7,102,566

This represents an increase of .24% in numbers of cattle, and a decrease of 1.69% in numbers of sheep, compared to calendar year 1958. Permits are issued for adult animals only. The offspring of permitted animals under six months of age are allowed to graze without additional charge. The total number of domestic animals -- permitted stock plus the offspring -- is about six million. In addition to the 31,242 permits covering the grazing of livestock under paid and free permits, 899 crossing permits were granted and 1,850 permits were issued for grazing on private land waived to the Government for joint management with Government land. The total number of permits issued was 2% more than in 1958.

Grazing receipts from the national-forest lands in fiscal year 1960 were $3,663,808 as compared to $3,750,916 in fiscal year 1959. Grazing fees are calculated each year by a formula which uses the average price per hundred pounds received by producers in the western States for beef and lambs. The variation in the average grazing fees per animal month are as follows:

	Cattle	Sheep
1960	$0.51	$0.0925
1959	0.50	0.1025
	+0.01	-0.01

Progress continues in the analyses of 11,000 national-forest range allotments to determine their condition and trend and management needs, with the completion of management plans on the equivalent of 543 allotments in fiscal year 1960. The total job is about 17% complete. In addition, the first Servicewide handbook of instructions for the analysis task was completed and issued.

Range Revegetation

During fiscal year 1960, 161,767 acres of depleted range and watershed lands were treated either by seeding with grass or legumes, or by the removal of competing vegetation. During fiscal years 1951 through 1960, a total of 888,163 acres of national-forest rangeland have been treated by methods which, through research and experience, have proved to be successful. An additional five million acres are in a depleted condition and in need of treatment. As research provides the methods for use on desert lands, high mountain meadows and other areas, the acreage possible to rehabilitate will increase.

Range Improvements

Funds for this work are used to maintain, to the extent possible, the $22 million investment in fences, water developments and driveways which are essential to obtaining better range management, and to construct new facilities. The following were constructed in fiscal year 1960:

798 miles of fence
7 miles of driveways
419 (each) water developments

Permittee cooperation in the maintenance and construction of range improvements amounted to an estimated total of $626,800 in 1960.

Soil and Water Management

Work done to improve watersheds and restore damaged, eroding lands was accelerated beyond any previous year's accomplishment. The maintenance work on completed measures has decreased steadily as vegetation becomes established.

In California emphasis in rehabilitation has shifted from the successfully completed Last Chance erosion project now on a maintenance basis to construction of erosion control measures on the deteriorated Casa Vieja Meadow on the high Kern Plateau and other projects.

In New Mexico, Taos Canyon restoration is being accomplished by installation of sediment basins, road and gully plugs, terraces and seeding on depleted lands. This work complements previous restoration measures in the major watershed where the beneficial results are already apparent from increased streamflow and improved fish habitat.

In Wyoming contour trenching and reseeding completed on flood source areas in the Swift Creek watershed is reducing peak flows and sediment from summer rainstorms thus diminishing the flood threat to the city of Afton, two hydroelectric plants, two reservoirs and numerous irrigation installations.

In Idaho restoration work accomplished in the West Fork of Elk Creek is reducing the amount of sediment being dumped directly into Palisades Reservoir.

In Colorado contour trenching, gully plugging and seeding of eroding areas on the Sheep Creek project has visibly reduced sedimentation during spring runoff.

On the Cherokee National Forest in Tennessee a good start was made in clearing the channel of Clear Creek. This stream has been choked with debris and sediment following the disastrous large fire of 1952, causing channel changes during periods of high water which repeatedly damaged roads and bridges.

In Oregon steady progress was made in sand dune stabilization where beachgrass, the first step in the restoration cycle, was planted on 114 acres. Scotch broom and shore pine were planted as a second step on an additional 114 acres already covered with beachgrass and 130 acres in the lowland areas were planted with barley, fescue and clover for both soil stabilization and game food.

In Lower Michigan beachgrass planting on 31 acres of scattered sand blows was combined with a red pine reforestation program on 500 acres of national-forest land.

The forest soils program was expanded in all regions except Alaska where preliminary work was begun. A series of special soils training schools of instruction for administrative officers of all levels was conducted in the western regions. Concurrently, a Soils Handbook designed for administrative use by national-forest personnel was developed, tested, and revised and is now in final draft for publication.

Collection of information on water yields and rates of erosion as related to multiple-use management of resources was continued. Continued progress is being made on the Beaver Creek project, Coconino National Forest, Arizona, where evaluation of the effects of pine stand modification, juniper control and clear cutting on watershed conditions is being made. Additional improvements such as access road construction and 15 weirs designed to measure water quantities during periods of low flow were installed.

Stream gaging stations were constructed on sample watersheds of the Apache, Fishlake, Payette, Toiyabe, and San Isabel National Forests. Information collected from them will guide the rangers in future observations and comparisons of effects of different land uses and management practices upon the water resources.

Some 40 crest gages were installed on the Bitterroot and Flathead National Forests to aid in obtaining preliminary streamflow data for administrative uses.

Mining Claims, Mineral Permits, and Leases

Mining Claims. In the mining claim field a major activity continues to be the determination of surface rights of mining claims under the Act of July 23, 1955 (P.L. 84-167), as shown by the following summary of progress to June 30, 1959:

Item	Number of areas	Acres	Estimated number of mining claims
Surface right determination to be done (revised estimate)	1,000	110,000,000	1,250,000
Field examination during 1960 ...	133	21,942,000	228,800
Total field examinations completed June 30, 1960	577	74,837,000	782,200
150-day publication period expired	503	61,305,000	645,000
Determination job complete	204	23,934,000	171,900

As a result of determination of surface right procedure there are now 16,100 mining claims on which the claimants have asserted the validity of their surface rights. These claims are now being examined by the technical mineral examiners to determine their validity. That means that on about 61,000,000 acres of national-forest land which included an estimated 645,000 mining claims the United States has the right to manage the surface, on all but 16,100 claims, and some of those may be resolved in favor of the United States.

Mineral permits and leases. The Act of June 11, 1960 places in the Secretary of Agriculture the same authority to dispose of common varieties of mineral materials on acquired national forest, land utilization, and certain other lands under his jurisdiction as the Act of July 23, 1955, gave him as to lands reserved for like purposes. Thus the disposal of all such material on Forest Service lands is now consolidated under a single procedure in the same agency. The permits and leases for oil and gas, coal, oil shale, potassium, sodium, phosphate, and sulfur on both public domain and acquired national-forest lands continue to be issued by the Bureau of Land Management, Department of the Interior, with the advice or consent of the Forest Service, and the Forest Service supervises the land management protection, restoration, and rehabilitation provisions of all leases and permits.

The volume of mineral leases on national-forest land reserved from the public domain has increased from 3,064,097 acres in 1951 to 11,383,883 acres in 1959, and is still increasing. The receipts are not credited as national forest receipts. However, mineral receipts were $1,200,219 in fiscal year 1960 for 1,666,539 acres of national-forest acquired lands under permit or lease. These are credited as national forest receipts.

Development of properties under lease and new properties will require increased supervision. Strip mining creates difficult land use and protection problems. Road construction, location of improvements, construction of dams and reservoirs, protection of soil, water, and other surface resources, and fire protection require continued vigilance.

Miscellaneous Land Uses

National-forest land may be used for special purposes when such uses are in the public interest. Now in effect are about 36,700 special-use permits for 80 different purposes such as pastures, sawmills, television transmitters, roads, and other desirable uses, plus 21,700 additional permits for such recreational uses as resorts, ski lifts, organization sites, etc. Such permits to public agencies are issued free, those to nonprofit organizations bear but a nominal charge, and those for commercial and individual use bear a fee based on the value of the land for the purpose. Fees for special land uses totaled $1,579,225 in 1960, in contrast to $1,450,542 in 1959.

Mapping

During fiscal year 1960, 34,265 square miles of planimetric mapping was completed, and 1,003 square miles of topographic mapping was completed. Contracts were awarded for an additional 21,821 square miles of aerial photography.

Good topographic maps are now available for about 37% of national forest needs. Reliable planimetric maps are available for approximately 48% of the areas of national forest interest exclusive of the National Grasslands.

Accomplishments during the year were facilitated by use of improved stereoplotting instruments, electronic surveying equipment, and machine computations for surveying and mapping requirements.

Land Line Locations

The work ahead in this area is estimated to consist of searching for and evaluating 736,000 property corners; remonumenting 746,000 property corners; and mark and post to standard, 208,000 miles of property lines. The property corners must be monumented before the property lines can be marked and posted to standard.

During fiscal year 1960, 13,915 property corners were searched for and evaluated. Of these corners, 8,886 can be permanently remonumented without any surveying. The remaining 5,029 corners will have to be relocated by surveys. Also, 4,243 corners were permanently monumented with standard iron pipe or concrete posts. A total of 125 miles of property lines were marked and posted to standard.

Land Exchange

Congress has passed about 90 laws authorizing the exchange of national forest land and timber for private or State lands intermingled with or adjacent to the national forest. The principal objective of these laws is to promote consolidation of the national forests for more effective land and water conservation, greater public service and more efficient management. In carrying out this program, emphasis is placed on (a) the exchange of scattered or isolated parcels to facilitate needed modification of national forest boundaries, to reduce the mileage and cost of

property line surveys, and to simplify national forest administration; (b) exchanges to block in areas where national forest and either private or State lands are checkerboarded or intermixed; and (c) transactions to make available national forest lands needed and suited for community or industrial purposes. During the year ending June 30, 1960, 74 exchange transactions were approved. In these transactions, 59,701 acres will be granted to the Government and 38,843 acres will be conveyed by the Government. These exchanges will block in national-forest lands and will help to consolidate or build up private properties or State conservation units.

Forest Fire Control

Calendar year 1959 produced continued advancement in techniques and administration in the task of controlling wild land fires. More aircraft were flown more miles on more tasks than ever before. Use of fire retardants applied from the air more than doubled. Special effort was made to make firefighting safer and increased attention was given to training in the many fire-control specialties.

Aircraft use went up in all phases. Fixed-wing aircraft flew 26,030 hours and helicopters 6,716 hours compared to 22,923 hours and 4,106 hours in 1958. Passengers carried were 35,723 compared to 26,300 in 1958. Commercial and privately-owned aircraft accounted for 82% of total hours flown. Air cargo work was down slightly. By comparison, the 1954 use of fixed-wing aircraft was 9,700 hours and helicopters 765 hours. IN that year 10,441 passengers were carried.

Increased helicopter use is significant. Helicopters provide rapid transport of men and equipment to remote and inaccessible danger points on fires. In initial attack men are placed on fires by helicopter and moved from one fire to another in a fraction of time required by other means. They are used for making long fire hose lays over steep and rugged terrain, drop fire retardant with pinpoint accuracy to spot fires and hot-spots on the fireline, and in initial attack. Helicopters supplement ground and fixed-wing airplane detection and are used extensively in reconnaissance of going fires.

Use of chemical fire retardants has increased greatly since this method of fighting forest fires was introduced in 1956. That year 123,700 gallons were cascaded to fires. In 1959, 3,360,000 gallons were dropped on 507 fires compared with 1,560,000 gallons on 322 fires in 1958. A special initial-attack air program was established in southern California in 1959 with good results. Facilities, equipment and personnel were planned to place at least 1,200 gallons of retardant on any fire in the four-forest area within 30 minutes. Helicopters were made available to augment the tankers by rapidly placing men and equipment at strategic points. Many potentially disastrous fires were stopped at small size by this approach.

The Calendar Year 1959 Fire Season

Extreme fire conditions in California with many costly and damaging fires featured the 1959 fire season. The severe drought in the Southwest and on the Pacific Coast caused fires to spread rapidly in all fuels and resulted in large losses in timbered areas in Arizona, California, and Oregon. These timber fires were costly to put out and produced the largest expenditure for forest-fire fighting in the history of the Forest Service. Fire conditions were normal east of the Rocky Mountains except in the Black Hills in South Dakota. In all far-West areas the fire season was worse than average.

The number of fires in 1959, 9,635, was slightly below the average number for the previous five years. Lightning fires were 8% below the five-year average number. Acreage burned was 288,606 compared to 116,453 acres in 1958 and a five-year average of 211,300 acres.

Fourteen lives were lost in fire control in 1959. In California five men were burned to death on one fire, one died from burns suffered on another fire, one died from injuries when struck by an aerial drop of fire retardant, one from pneumonia caused by smoke inhalation, one from a heart attack, and one in a truck accident. In Idaho, three men died from burns received in an airplane-landing accident. One man was killed in Utah when struck by a helicopter rotor blade.

(Note: Activities during the calendar year 1960 fire season are covered in a following section under "Fighting Forest Fires".)

Construction and Maintenance of Structural Improvements

These funds cover structural improvements and communication systems for general administrative purposes, including fire control, under the national forest protection and management activity.

Improvements to be maintained are selected on the basis of most urgent needs within classes of improvements, such as lookouts, housing, storage, facilities, offices, telephone lines, radio systems, etc.

Construction funds have been used to meet urgent needs for replacement or betterment of existing improvements and for urgent additions. Priority has been given to construction of dwellings and barracks to house employees in localities where private rentals are not available. Construction and betterment of the following improvements was accomplished during fiscal year 1960:

Type of Building	Number of Units (by Fund Sources)					
	Construction			Betterment		
	National Forest Protection and Management Activity	All Other Funds	Total	National Forest Protection and Management Activity	All Other Funds	Total
Dwellings and barracks	87	43	130	84	11	95
Fire lookouts ...	22	-	22	11	-	11
Service and storage buildings - all types	55	40	95	84	18	102

Rehabilitation of Burns

This item was established for the first time in fiscal year 1961 with an appropriation of $300,000 which was later increased to $1,050,000 with a supplemental appropriation of $750,000. It provides for the rehabilitation of critically burned areas which do not qualify as emergency projects "to safeguard lives and property" under the limited funds available for the purposes of Section 216 of the Flood Control Act of 1950. Specifically, these new funds provide for rehabilitation of burned areas not generally located on watershed from which floods would eminently threaten life or property but where site deterioration, if not stopped, would progressively worsen. On commercial forest lands tree planting for timber production is the major job complemented with supplemental measures such as grass seeding, channel clearing, terracing and gully plugging. On non-commercial forest lands where damaging water runoff and soil erosion are likely, emphasis is directed toward watershed protection by grass seeding, terracing, gully plugging and other recognized restoration measures.

Fighting Forest Fires

Current Activities: This program covers fire fighting on the national forests and the build-up of emergency fire fighting forces under peak burning conditions. Experience has demonstrated that material savings are made by having a strong force ready to discover, attack and stop fast-spreading fires while they are small. Expenditures for the regular fire control organization are financed from the activity "National Forest Protection and Management." The temporary build-up in forces when fire conditions are critical and the suppression of fires is financed from the "Fighting Forest Fires" fund.

Selected Examples of Recent Progress

Activities during the calendar year 1959 fire season are reported under "Forest Fire Control" of the "National Forest Protection and Management" activity.

Calendar year 1960 has been one of the most severe fire seasons of record resulting in an all-time high expenditure for fighting forest fires. Critical fire conditions first developed in Arizona and California. June was a very hot month with no precipitation in Arizona, New Mexico and central and southern California. These severe weather conditions, combined with the drought buildup of several years, resulted in extremely dry forest fuels. Many fires started during June, and a few became large and costly. By mid-July, extreme high fire danger developed over many areas west of the Continental Divide. Prolonged high temperatures and practically no precipitation culminated in one of the most disastrous forest fire situations in the western states in the past 30 years. Heavy concentrations of dry lightning storms at that time struck California, Oregon, Washington, Montana, and Idaho. More than 1500 fires were started in a few days and spread rapidly. Most fires were controlled while small, but 53 were more than 300 acres in size and 26 burned more than 2000 acres each. Fighting these many fires, particularly with so many occurring at one time, required massive mobilization. During the critical two weeks, June 14 to 28, peak employment of fire fighters exceeded 25,000. Hundreds of tractors and fire pumpers and more than 300 aircraft were used.

Conditions in Washington, Montana, and northern Idaho improved by early August, but continued severe elsewhere in the West. There were 22 fires that burned more than 300 acres each during August. One in California burned 46,000 acres. During July and August, 6281 fires burned 343,518 acres, compared with the five-year average of 4638 fires and 62,717 acres.

As a result of these disastrous fires a supplemental estimate of $31,500,000 is being submitted for fiscal year 1961.

Insect and Disease Control

Current Activities: The purpose of this program is to check losses inflicted on the Nation's forests by destructive insects and diseases, losses that exceed those caused by fire. Two national pest control laws provide for combating forest pests on Federal lands and for shared responsibility with State and local governments and private owners in the control of forest insects and diseases on non-Federal forest lands. These are the Lea Act of 1940 which applies specifically to the introduced white pine blister rust disease and the Forest Pest Control Act of 1947 which applies to forest insects and all other tree diseases. Responsibility for combating forest diseases and insects under these acts, which is vested in the Secretary of Agriculture and delegated to the Chief of the Forest Service, includes taking measures known to be effective in preventing or minimizing pest depredations in the forest, detecting outbreaks that may need control, evaluating the damage potential of such outbreaks to decide whether control can and should be done, and, where control is needed, taking the required action on the national forests and assisting other Federal agencies, the States and private owners with control on their lands.

Selected Examples of Recent Progress

White Pine Blister Rust - Calendar Year 1959

Control of white pine blister rust has been attained on 18.5 million acres currently selected for protection from this disease. In 1959 activities were centered on work to maintain this condition as well as to make additional progress with control on 4.5 million acres of white pine still unprotected and, in north Idaho, where the greatest problem exists, to fully explore and use the recently developed antibiotic fungicide approach to control.

a. Initial work in pine areas not previously treated was done on 58,368 acres.
b. Rework was done on 179,347 acres.
c. Maintenance work was done on 1,299,217 acres.
d. Surveys to determine pine stocking and ribes populations covered 2,465,219 acres.
e. A total of 4,113,171 western white pine trees, mostly in north Idaho, were individually treated with antibiotic fungicides. Use of antibiotic fungicides in combating blister rust in western white pine has developed into a major control tool. When a specially developed antibiotic fungicide is applied to the basal stem of western white pine, all potentially damaging infection is killed on trees 50 feet in height regardless of location of the infection in the tree. Antibiotics were also tested as a foliar spray in both water and oil solutions and applied by helicopter. Results were encouraging and large-scale aerial application of antibiotics may come into practical use in the near future.

f. Sixty-eight temporary forest camps were established in western states to quarter 1,382 seasonal employees. In the central and eastern states 701 local seasonal workers were employed. In addition to this labor force, 588 contracts for control work on 37,284 acres were awarded on a competitive bidding basis.
g. States, counties, towns, and owners contributed $675,936 to the control program on non-Federal lands.

Insects and Diseases Other than Blister Rust:

Detection and Appraisal Surveys

Forest Diseases

Because of the influence of climatic factors upon their potential for epidemic development and for less well understood reasons, forest tree diseases fluctuate in extent and intensity. Some get worse and progress more rapidly while others decline in severity. The following summary reports on several important diseases that are increasing or decreasing.

Diseases Apparently on the Increase

Fomes annosus root rot is on the increase in eastern conifer stands, especially in plantations reaching the age of first thinning. It is well established and spreading in three-fourths of the thinned slash pine plantations examined in the Southeast and in half of the thinned red pine plantations in the Northeast. This killing disease is also found on other conifers in the East and is widely scattered on a variety of conifers in the West.

Dwarfmistletoes spread and intensify rather slowly, but more detailed recent studies on their damage to western pines invariably show the estimates given in Timber Resources for America's Future were too low. Both growth losses and mortality were underestimated.

Comandra rust, previously known to be severe on lodgepole pine on six national forests in Region 4, is now known to cause heavy losses in stands of this same species on five national forests in Region 1. This does not indicate recent spread or intensification of the disease, but rather a more complete survey coverage.

Diseases Apparently on the Wane

The area of pole blight of western white pine is no longer enlarging, and it has commonly been noted that the disease has ceased to spread in infected trees. These developments lend added support to the hypothesis that pole blight was brought on by soil moisture stress induced by a series of very dry years.

Oak wilt continues to be confined to the external boundaries identified five or six years ago. Evidence is accumulating that control efforts, where intensively and effectively applied, are slowing down local spread of the disease.

Sweetgum blight-infested trees are showing improvement and even recovery in areas where rainfall is again approaching the annual norm. This is especially true in the Delta region of the South where decline and death of sweetgum was shown to be primarily a result of drought.

Maple blight did not spread appreciably last year in either Florence or Iron County, Wisconsin, the only areas previously known to be affected.

Hypoxylon canker population levels on aspen in the Lake States are now lower than in the immediately preceding years.

Birch dieback in the Northeast is becoming stabilized, with some general improvement noted.

Forest Insects

Adequacy and accuracy of surveys improved on public and private forest lands. Public and private landowners and land-managers improved the adequacy and accuracy of forest insect surveys by intensifying periodic inspection of forest properties and by more promptly investigating reported outbreaks to determine the need for suppressive controls.

Surveys reveal spruce budworm infestations increased in severity in mixed-conifer forests country-wide. The scope and severity of spruce budworm infestations increased in most of the mixed-conifer forests from coast to coast. Noticeable defoliation in Maine covered 940,000 acres and infestations in Minnesota spread to more than 1,000,000 acres. In the central and southern Rocky Mountains, and in north Idaho and Montana, gross area infested approximated 4,500,000 acres. Lighter damage on less area occurred in Oregon and Washington. Aerial application of insecticides was undertaken by public and private agencies to suppress epidemic populations and preserve forest stands in severely defoliated areas in Maine, Minnesota, and Montana.

European pine shoot moth discovered for the first time in Washington. The European pine shoot moth, a serious pest of young pines which was accidentally introduced into the United States from Europe many years ago, was found for the first time in the Pacific Coast States on ornamental pines near Seattle and at Spokane, Washington. Inasmuch as this insect pest is a potential threat to ponderosa pine stands in the western States, eradication of the insect pest in that area is being considered.

Bark beetles cause severe timber losses in pine stands of California. Timber losses caused by several species of pine bark beetles in California reached the highest level of any year for the past decade. Many serious western pine beetle outbreaks developed in ponderosa pine across the State; infestations of the mountain pine beetle in sugar pine were numerous and widespread; the Jeffrey pine beetle increased in many areas; and pine engraver beetles damaged and killed large numbers of trees. Suppressive action was promptly initiated to avert spread of infestations and to reduce the rate of tree-killing in areas most severely affected.

Outbreaks of pandora moth discovered at several locations in western States. The pandora moth, a serious pest of pines in the western States, was found in outbreak status at several locations. In California, infestations were centered at two places in San Diego County; in Utah, a single outbreak covered 15,000 acres of lodgepole forests in the Uinta Mountains; and 9,000 acres were infested in eastern Colorado and western Wyoming. The outbreak in Oregon, first discovered in 1958, was brought under control by natural factors and is no longer a threat to the forest resource in that area. Disease organisms may exert a controlling influence on current outbreaks and thus preclude the need for insecticidal sprays to protect the resource affected.

Larch casebearer infestations spread over 8,000 square miles in northern Idaho and northeastern Washington. The larch casebearer, a major forest insect pest accidentally introduced into the Intermountain Region in recent years, was found throughout most of northern Idaho and northeastern Washington in 1959. The area of infestation, encompassing about 8,000 square miles, is twice the size of the area known to be infested in prior years. Major efforts were made during the year to introduce parasitic insects from the eastern United States for biological control of this destructive pest.

Scope of black-headed budworm infestations increases in hemlock-spruce stands of southeastern Alaska. The infestation of black-headed budworm, newly discovered at Ketchikan, Alaska during 1958, was found in additional areas in 1959. The status and distribution of this major pest in the Cholmondely Sound area, in the vicinity of Kasaan Bay, the Portland Canal, and elsewhere in the hemlock-spruce forests in Alaska, is being investigated to determine the possible need for suppressive control.

Surveys point up importance of insects destructive to cones and seeds of coniferous trees. Surveys show that a large percentage of the cones and seeds of coniferous trees in all sections of the country are destroyed annually by several species of insect pests. Losses during 1959 were particularly severe in stands of Douglas-fir and sugar pine in California, Oregon, and Washington, and in stands of southern pines in the southern and southeastern States. Investigations are being made to develop methods for control.

Aerial surveys reveal spread of Virginia pine sawfly into North Carolina. An outbreak of the Virginia pine sawfly, present in portions of Maryland and Virginia since 1954, was found to have spread southward into North Carolina in 1959. A marked increase in feeding intensity occurred throughout the Coastal Plain and Piedmont in Virginia and an abundance of suitable host material in North Carolina favors sawfly increase and spread in that area. Public and private agencies are expected to undertake action to suppress populations if additional defoliation threatens to kill affected trees.

Surveys reveal epidemic centers of southern pine beetle in southeast Texas and in North Carolina. The southern pine beetle developed rapidly to outbreak proportions in the Big Thicket of southeast Texas and in Tyrrell, Hyde, and Dare Counties, North Carolina. In some places within the outbreak areas as many as 100 trees were killed in groups, an indication of aggressive infestations likely to spread; thus landowners in the affected areas promptly initiated suppressive action for control.

Severity of defoliation by elm spanworm decreases in southeastern States. The elm spanworm which kills many oaks and hickories has occurred in outbreak status in portions of Georgia, Tennessee, and North Carolina since 1954. Spread of infestations has been gradual over an area of 860,000 acres. There were no areas of heavy feeding in 1959 and surveys indicate severity of defoliation will continue to decrease as a result of natural control factors.

Control Accomplishments - Calendar Year 1959

Oak Wilt

a. The Forest Service participated in Federal share-the-cost programs to control the destructive oak wilt disease in six States.

b. About 41 million acres of non-Federal land and 4 million acres of national forest were aerially surveyed to detect infected trees.

c. On non-Federal land, 4,052 infected trees were located and treated; on Federal land, 19 trees were located and treated.

Dwarfmistletoe

a. Sixty-five thousand infected trees on 2,928 acres were treated on national forests as a pilot test to determine costs and best operational methods.

b. Forty-two thousand acres of mistletoe-infected forest areas on national forest land were intensively surveyed to develop techniques and criteria for selecting stands requiring control.

Insects

Outbreaks of insect pests are detected by foresters and entomologists of all forest ownerships reporting to the Forest Service and through the planned detection and evaluation surveys conducted annually by the Forest Service. In 1959 control activities involved 16 species of bark beetles and weevils and 8 species of defoliators on 80 national forests and in 15 States in share-the-cost projects with State and private land managers and owners.

Significant accomplishments are summarized as follows:

Ownership	Chemical Suppression of Bark Beetles	Chemical Suppression of Spruce Budworm	Chemical Suppression of Other Insects
	No. of Trees 1/	No. of Acres	No. of Acres
National Forests	678,092	115,388	25,479
Non-Federal	6,971	18,733	21,782
Total	685,063	134,121 2/	47,261

1/ Includes infested trees, stumps, and cull material.
2/ Represents only a small portion of the total infested area nationwide.

(Revised)

OBLIGATIONS, INSECT AND DISEASE CONTROL FUNDS,
FISCAL YEAR 1960 AND ESTIMATES FOR FISCAL YEARS 1961 AND 1962

Projects	1960	1961 (Estimated)	1962 (Estimated) 1/
Barkbeetles			
Montana-Northern Idaho	$29,562	$40,000	$50,000
Colorado-Wyoming-South Dakota	92,614	106,000	100,000
Arizona-New Mexico	2,241	38,000	200,000
Utah-Southern Idaho-Wyoming	423,214	345,000	100,000
Utah (Wasatch and Ashley)	508,957	2/ 569,100	70,000
Wyoming (Bridger)	6,393	16,000	380,000
California	234,502	380,000	200,000
Oregon-Washington	30,500	25,000	30,000
Southern-Southeastern States	173,111	270,000	300,000
Defoliators			
Montana-Northern Idaho	111,132	20,000	500,000
Colorado-Wyoming-South Dakota	1,244	5,000	630,000
Arizona-New Mexico	21,336	5,000	800,000
Southern Idaho	---	6,000	300,000
Oregon-Washington (European pine shoot moth)	---	87,000	150,000
Northeastern States	46,000	32,000	7,000
Southern-Southeastern States	12,837	40,000	---
Minnesota (spruce budworm)	61,934	11,900	200,000
Michigan-Wisconsin (spittlebug)	22,264	14,000	7,000
Michigan-Wisconsin (Jack pine budworm)	2,220	---	100,000
Alaska	6,400	10,000	30,000
Forest Tree Diseases			
Eastern States (oak wilt)	99,300	99,000	99,000
Western States (dwarfmistletoe)	45,400	42,000	67,000
Other Forest Service Projects			
Pre-control work and administration 3/	637,981	516,800	583,000
Department of the Interior Insect and Disease Projects	227,300	295,000	220,000
Subtotal, All Control Projects	2,796,442	2,972,800	5,123,000
Detection and Evaluation Surveys	802,204	914,000	914,000
Unobligated balance	29,454	---	---
Total available or estimated	3,628,100	3,886,800	6,037,000

1/ Estimates of project needs are forecast a year or more in advance of anticipated use. They are subject to fluctuations. Adjustments are always required between projects depending on discovery of new outbreaks and expanded needs on going projects.

2/ An additional $290,900 was made available for insect control projects by reprogramming other Forest Service funds ($110,200 Blister Rust Control, and $180,700 National Forest Protection and Management, mostly Timber Sales).

3/ This item provides funds for administration of the Forest Pest Control Act, for continuous pre-control activities, and for quick action on many forest insect and disease projects nationwide to stop outbreaks while they are small.

DEPARTMENT OF THE INTERIOR

(Activities under funds transferred from this Appropriation for Insect and Disease Control)

Introduction

Prevention of serious losses from diseases and insects in the forests under the jurisdiction of the Department of the Interior is an important activity under the Forest Pest Control program. Approximately 183 million acres of forest and woodlands are administered by the Department of the Interior, including 7 million acres by the National Park Service, 1 million acres by the Bureau of Sport Fisheries and Wildlife, 14 million acres by the Bureau of Indian Affairs, 36 million acres by the Bureau of Land Management in the continental United States, and 125 million by that Bureau in Alaska.

Control Accomplishments

White Pine Blister Rust

There are 586,592 acres of control area administered by the Department of the Interior, of which 375,829 are under the direction of the National Park Service, 67,819 under the Bureau of Land Management, and 142,944 under the Bureau of Indian Affairs.

In the calendar year 1959, the National Park Service, the Bureau of Land Management, and the Bureau of Indian Affairs collectively destroyed 1,357,000 ribes on 20,093 acres, of which 5,575 were initially worked and 14,518 reworked. Of the total control area, 456,438 acres or 79% is on a maintenance basis.

The National Park Service and the Bureau of Land Management are using antibiotic fungicides in conjunction with Ribes eradication to control blister rust in western white pine control areas. Work with antibiotics will be expanded as this new control tool is further developed.

The Bureau of Indian Affairs continued with control work on eastern white pine in the Lake States. The trust responsibility on the Menominee Reservation will be terminated during fiscal year 1961, thereby reducing the control area under the direction of the Bureau by 43,107 acres.

Insects and Other Diseases

For many years a program to maintain a low level of infestations and infections and to prevent epidemics within the intensively used scenic and recreation areas of the national parks has been successful in conserving these valuable forests. A number of relatively small but nonetheless important control projects are involved in this program. Most of these projects require annual

attention to maintain the forests in a healthy condition. Examples are the bark beetles in the California national parks, the defoliators in the southwestern national parks and monuments, dwarfmistletoe in Grand Canyon National Park, and oak wilt at Effigy Mounds National Monument. Examples of similar projects for the Indian Reservations are the Great Basin Tent Caterpillar at the Navajo Reservation, the Saratoga Spittlebug on the Lac Courte Oreilles Reservation, Wisconsin, and the Southern Pine Beetle on the Cherokee Reservation in North Carolina.

The Bureau of Indian Affairs will conduct a second treatment on an experimental area designated to test the effectiveness of control of dwarfmistletoe on the Mescalero Reservation, New Mexico. This recleaning project is expected to require three years for completion. The Bureau is faced with an outbreak of spruce budworm on approximately 85,000 acres on the Navajo Reservation.

Major projects are under way to control serious insect infestations and prevent widespread destruction of the forests in three western parks. These include mountain pine beetle control in Grand Teton, Lassen Volcanic and Yosemite National Parks, and an aerial spray project against lodgepole needleminer on 4,000 acres within the scenically important Tuolumne Meadows section of Yosemite National Park.

Quite frequently infestations involving the forests of this Department likewise concern adjacent National Forest areas. The following are examples requiring coordinated control:

Mountain pine beetle outbreak in Grand Teton National Park and the adjacent Grand Teton National Forest.

Spruce budworm on 93,411 acres in Montana where public domain forests are intermingled with private lands and lie adjacent to national forests.

Bark beetle infestation at Bryce Canyon National Park and the adjacent Dixie National Forest.

Mountain pine beetle infestation which involves a total of 45,000 acres of public domain forest lands and State and private forest lands in northern California.

Bark beetle outbreak in sections of Sequoia and Kings Canyon National Parks and adjoining Forest Service, State and private lands in California resulting from the McGee Ranch fire of 1955.

Acquisition of Lands

These funds are used to acquire lands for the protection of the watersheds of navigable streams and for the production of timber under the provisions of the Weeks Law of March 1, 1911, as amended (16 U.S.C. 513-519, 521). There are national forests and purchase units in 29 States within which acquisition of lands under the above authority has been approved by the National Forest Reservation Commission and in which lands still remain to be acquired. Essentially all of these units are in Eastern United States.

In fiscal year 1960 there were 58 tracts containing 5,669 acres approved for purchase pursuant to the Weeks Law. These lands are located in 15 national forests in 12 States. There are many more similar key tracts surrounded in whole or in part by national forest land which are suitable for national forest purpose and which should be acquired to meet specific administrative and resource conservation needs. Purchase of such lands will result in increased efficiency and economy in administration of and increased public benefits from national forest lands.

FOREST RESEARCH

The Forest Service conducts research on problems pertaining to all forest land and on the management of related non-forest rangelands, including State and private holdings as well as national forests and other Federal lands.

The research is carried on primarily at the Forest Products Laboratory, Madison, Wisconsin, at nine regional forest and range experiment stations in the continental United States, and at forest research centers in Alaska and Puerto Rico. Much of the research at the regional stations is concentrated at laboratories and at field research centers including experimental forests and ranges where major problems may be studied advantageously.

The research is to a large extent cooperative with States and private agencies. The following fields of research are under way:

Forest and Range Management Research

Current Activities: Research under this activity is concerned with the growing of timber and the management of forest properties, the management and efficient use of range forage, the management of both forest and range vegetation to produce the greatest amount of usable water and to minimize erosion, and the management of forest recreation resources.

Forest management research emphasizes the development of methods for quickly increasing the growth rate of forests and hence the permissible annual cut. Emphasis is given to harvest cutting patterns that promote regeneration of the forest or increase growth and quality of residual stands. Also being stressed are measures leading to control of undesirable vegetation competing with crop trees. Methods of reforesting farm lands withdrawn from cultivation, stripped mining lands, and cut or burned-over forests, are being improved through research. The development of hybrid trees for faster and more certain timber production is being studied, as well as improved methods for stimulating gum flow in pines for the production of resin.

Wildlife habitat and range management research emphasizes development of methods and practices for building up or maintaining forage production on forest and related non-forest ranges, and for its efficient utilization by game and livestock, at maximum levels consistent with other values of land for watershed, recreation, timber production, or other uses. Emphasis is being placed on determination of proper intensities of stocking, systems of grazing, and seasons of use for native ranges, seeded ranges, and ranges on which undesirable plants have been controlled. Methods are being developed for coordinating livestock and big game use of the same ranges. Studies are also under way on the use of fire in the control of undesirable range plants, and the development of methods for restoring and managing desirable forage plants on game ranges.

Watershed management research is directed toward improving soil and cover conditions and practices to alleviate flood and sediment problems associated with the use of forest and related range land, and toward helping meet urban, rural, and industrial demands for water of good supply and high quality. Watershed use problems are attacked by obtaining quantitative measurements of the effects of such activities as fire, logging, grazing, and road construction on water supply and quality. Concurrent with these studies are those to determine how to use watersheds for various economic purposes and still provide satisfactory water supplies. Possibilities of increasing water yield through maniuplation of the vegetation and control of snow accumulation and melt are being studied. Particular attention is being given to the effects of watershed use and management on study areas as they are reflected in soil-plant-water relations. This provides both an understanding of the cause and effects of given measures and a means of predicting the magnitude of results from applying watershed use and management measures on other areas.

Forest recreation research concentrates on developing basic facts on forest recreation, and providing guidelines essential to the forest land manager in making policy and program decisions. This research includes studies of the resource, the people who use it, and the relation of recreational use to other uses of forest land. Major emphasis is placed on: devising techniques for measuring and classifying forest recreation use, and for inventorying forest recreation resources; investigating factors influencing incentives, desires, and choice of recreation activity by the recreationist; improving procedures for making projections of future recreational use; determining methods for management, protection, and rehabilitation of the recreation resource; developing guides to determine carrying capacities of various types of recreation resources; and on studies in coordinating recreation with other forest uses, and evaluating effects of other forest uses on forest recreation values.

Selected Examples of Recent Progress

Forest Management Research

Soil fertility, light, and mycorrhizae. Mycorrhizae--minute, complex structures formed in the soil by a coupling of tree roots and certain fungi--are known to have a profound influence on the growth of some tree species, especially in the seedling stage. The exact nature of the relationship between mycorrhizae and roots and fungi is not fully understood, although it is known to be associated with the availability of nutrients to the tree. Experiments with seedlings of Virginia, loblolly and white pines have revealed that mycorrhizal development is also tied to interrelationships of light and soil fertility. Best development occurred in full sunlight under natural day-lengths, and in unfertilized soil. Under high soil fertility levels, such as occur in forest tree nurseries, mycorrhizal development is inhibited. This may be partially responsible for planting failures on poor sites, since the nursery-grown seedlings lack the mycorrhizal development on their roots needed to help pick up the scant supply of nutrients.

Sand pine regeneration problem solved. A five-year study to find out how to regenerate sand pine in central Florida has been successfully completed. Previously foresters have been unable to duplicate, under conditions of fire protection, the fine young stands which nature had produced following destructive wildfires. To find the solution it was first necessary to learn requirements for seed production and germination and seedling survival of this valuable but little known timber species. Then forestry practices had to be worked out that would meet those requirements. It was found that clear-cutting the mature stand in summer and fall, following with mechanical scarification of the ground, and then lopping and scattering cone-bearing branches and tops of the harvested trees usually gave satisfactory natural regeneration.

New knowledge strengthens silvicultural practices. An important question in many forest types that are adapted to the clear-cutting system of silviculture has been, how far into the cut area can restocking be expected from bordering uncut stands. This question has now been answered for a number of important timber species. For example, in Alaska studies have shown that western hemlock will not reproduce satisfactorily beyond a quarter mile except with a high wind or heavy seed crop. In good seed years western larch in Montana will restock openings for about the same distance, but not over 250 feet in poor seed years. Seed from sugar maple and yellow birch in Michigan's upper peninsula will successfully establish a new stand to a distance of about 330 feet following good seed years. Such information for these and other major species now makes it possible to plan cutting so as to avoid making openings too large to restock naturally.

Chemical debarking permits advantageous "stump-storage" for charcoal. Results of experiments in Maryland have proven the practicality of "storing" low-grade hardwoods on the stump for a year prior to their harvest for charcoal. Chemi-peeling with sodium arsenite, which kills the tree and loosens the bark, permits the producer to leave trees standing ready to use with a resultant saving of one handling of the wood and a reduction of storage space requirements at the yard. This procedure also results in a better quality of charcoal. Furthermore, the peeled wood yields about 11 percent more charcoal per unit volume than unpeeled wood, which alone can more than offset the cost of the chemi-peeling operation.

Growth and yield of pine plantations. A comprehensive growth study of slash pine plantations has been completed in the Middle Coastal Plain. This research has provided a series of site index curves, cubic-foot volume tables, cubic-foot yields and wood-weight yields of plantations by spacing and by site productivity classes. These are essential tools in the big job of managing slash pine plantations.

Timber buyers' question answered. Thousands of acres of second-growth yellow-poplar are reaching merchantable size every year in southeastern United States. These stands need thinning for sawtimber at about 50 years of age, but Appalachian timber buyers haven't had a satisfactory basis for estimating what this young sawtimber is worth. In four studies designed to meet this need, the Southeastern Station found that existing

hardwood log and tree grades give workable estimates of lumber values for young yellow-poplar, and can be used with confidence by timber cruisers and appraisers.

Defining the climate suitable for slash pine. Slash pine is the most widely planted, in terms of numbers of trees, of all the southern pines. But the natural range of slash pine is small compared to the other three important southern pine species. Because of its desirable features, there is a tendency to plant it outside of its natural range in spite of the natural hazards to its survival and growth. To help delineate the areas where it could be expected to do well a study was made of 21 elements of climate in relation to the presence or absence of naturally occurring slash pine. The key feature of the 21 elements tested was the average frequency of days in summer, spring and winter when more than a half-inch of rainfall occurred.

Genetics and Christmas trees. With increasing activity in Christmas tree culture, there is need for better information about the best varieties of the commonly used species for salable trees. In one study of eastern red cedar, an increasingly popular species, trees from eight widely scattered sources were grown in southern Illinois. Six years after planting considerable variation in survival, growth rate, color of winter foliage, crown and leaf form and resistance to cedar-apple rust was evident among the various sources. Crown form, for example, ranged from broadly conical among trees from Tennessee and Illinois to a slender or cylindrical shape typical of those from North Carolina, Nebraska and Wisconsin. Winter foliage color, another important feature, proved to be a characteristic of each source. Trees from some locations turned brownish, reddish or purplish, while those from central Tennessee stayed green all winter. Considering all features, Tennessee trees were generally superior to those from other sources, including the southern Illinois variety.

Zoning for intensive management. Black cherry is one of the most valuable hardwood species in the Allegheny Plateau. It does not do well on all sites, however, and for many years foresters have been handicapped by lack of knowledge of how to recognize and map areas where intensive management for this species is justified. Now research has developed a system for zoning forest land for black cherry management. Based on careful study of cherry occurrence and growth in relation to site quality, fire risk, frequency and severity of damage from ice formed on twigs and branches during freezing rains, species composition and deer populations, this method enables the forester to use elevation and forest types to identify favorable zones. The best of these zones is found below 2,000 feet and in the Allegheny hardwood type. In other zones unfavorable combinations of the factors mentioned make successful management of black cherry uncertain or impractical. On the Allegheny National Forest 702,000 acres have been mapped using the above criteria. Fifty-nine percent of this acreage proved to be favorable for cherry management.

Wildlife Habitat and Range Management Research

Rest-rotation grazing is effective during drought. Rest-rotation management is a scientific system of alternating range grazing use and non-use based on growth requirements of major forage species. It has been under a practical test on a native perennial bunchgrass range on the Lassen National Forest in California for eight years. In 1959, one of the driest years of record, the system had a severe trial. With only 9.58 inches of precipitation annually where the longtime average is 18 inches, cattle condition was satisfactory and on some parts of the range the vegetative condition apparently improved.

Mesquite control increases forage production. Additional forage produced by native grasses and Lehman lovegrass as a result of spraying mesquite on the Santa Rita Experimental Range in Arizona was sufficient to repay the cost of treatment in 4 years. In 1959, 5 years after initial spraying, herbage production was 833 pounds per acre where 58% of the mesquite was killed versus 548 pounds per acre in untreated areas. In another study, begun in 1945, perennial grass herbage yields were increased up to 10 times their original production as a result of thinning mesquite.

Seeded areas provide forage and firebreaks. In Louisiana, K31 fescue, bahia, and bermuda grasses and lespedeza survived satisfactorily under heavily grazed conditions on seeded areas and remained in suitable condition to serve as forage firebreaks. The seeded species survived better on these grazed than on ungrazed areas because of the greater competition from native species on the latter.

Deer population closely related to habitat condition. Under favorable habitat conditions on the Ozark National Forest in Arkansas deer increased rapidly and the population soon exceeded the habitat potential for optimum carrying capacity. This caused a severe decline in production of forage and subsequently in deer numbers. In some cases desirable forage species were also reduced by closure of the canopy (mainly white oak) as timber stands matured. Habitat improvement in such areas apparently requires opening of timber stands as well as curtailment of deer numbers. However, total exclusion of deer, even if feasible, is probably unnecessary, for an abused habitat appears to recover as rapidly following reduction of heavy use to a light-to-moderate level as under complete protection.

Promising results achieved in revegetation of depleted big-game ranges. Both small plots and pilot operations have given encouraging answers to the question of whether and how much forage production for game and livestock can be increased on run-down juniper-pinyon areas in Utah. Observations over the past four years on 225 species and strains of shrubs and forbs show at least 30 will be useful for improving the quality and quantity of the forage. A natural hybrid of bitterbrush and cliffrose appears especially promising. It retains the wide amplitude of adaptation of bitterbrush and the evergreen habitat of cliffrose. Fourwing saltbush also shows important and useful adaptation

to foothill areas in Utah. It possesses the unique and desired characteristic of making its most prolific growth when much of the other vegetation is drying up. It is palatable to all grazing animals.

Repellents reduce grazing damage to pine seedlings. In Louisiana, copper carbonate in asphalt emulsion was the most effective of several repellents in an experiment designed to reduce cattle grazing damage to planted slash pine seedlings. About half of the treated seedlings escaped damage on an open range with a high concentration of cattle, whereas more than 90 percent of the untreated seedlings were dead or heavily browsed. All seedlings treated with copper carbonate were damaged to some extent by the chemical, but those planted within 7 days of the treatment grew and survived as well as the untreated.

Gophers subsist mainly on forbs (herbs other than grass). Analysis of 213 pocket gopher stomachs collected periodically between June 29 and September 16 from mountain grassland range on Black Mesa, Colorado, has shown that gopher diet consisted of 94 percent forbs, and 6 percent grass, where vegetation composition was 50 percent grass, 42 percent forbs and 8 percent shrubs. As previously reported, reduction of these forbs by spraying with 2, 4-D also causes a reduction in the gopher population.

Watershed Management Research

Water yield increases continue at Fraser. In 1955 a study to determine effects of cutting on water yields was initiated on the Frazer Experimental Forest in Colorado. Forty percent of the area was clearcut in strips, resulting in a greater accumulation of snow in the openings than in adjacent uncut areas, due to less interception by tree crowns, and a more uniform rate of snow melt. In addition water loss through tree use was greatly reduced by the partial removal of forest cover. As a result water yield during the four years following cutting has increased by an average of 3.2 area inches annually.

Stream turbidity controlled by careful logging. The usual standard maximum turbidity acceptable for drinking water is 10 parts per million (ppm) of solid matter. Results of research to define the degree of stream turbidity expected under several systems of logging in West Virginia show that cutting operations, if carefully designed, need not seriously reduce water quality. In the study on the Fernow Experimental Forest intensive selection cutting with carefully planned skidroads resulted in a maximum stream turbidity of only 25 ppm as compared to a maximum of 15 ppm in an unlogged watershed. Extensive selection cutting, but with planned skidroads, produced turbidity of 210 ppm. But where a watershed was commercially clearcut with no planning for skidroads stream turbidity rose to 56,000 ppm. Nearly four times as much area was disturbed by skidroads on the clearcut watershed as on the intensive selection cut, and active disturbance continued over a longer period of time.

Snow fences create natural reservoirs of water. In the high mountains of central Utah, the effectiveness of sections of slat-constructed snow fence, 14 and 21 feet in height, in increasing extent and depth of snow drifting was studied. The following tabulation shows the cubic feet of water storage induced per linear foot of each of the fences:

	14 ft.	21 ft.
April 15	334	419
May 20	270	362
June 15	Trace	47

The snowpack on unfenced areas had virtually disappeared by April 15, but drifts behind the 14-foot fence lasted until June 15 and behind the 21-foot fence until June 20.

Evapo-transpiration losses highly variable. Losses of water through evaporation and transpiration by plants are important in water conservation. Experiments at several locations in the West are revealing the magnitude and variability of these losses for different types of covers. This knowledge is an essential prerequisite to the formulation of management practices for increasing water yield through control of vegetation. For example, at the San Dimas Experimental Forest in southern California during five dry years (1952-57) with average rainfall of only 20.6 inches, annual evaporation loss from bare soil averaged 7.4 inches. However, water loss from a grass-covered plot averaged 15.7 inches, about the same as from a plot of Coulter pine, but corresponding losses from four shrub-covered plots averaged 16.9 to 18.0 inches. In contrast the year 1958 produced 48.4 inches of rain and evapo-transpiration losses increased. Loss from bare soil was 8.7 inches; from grass 16.5 inches; pine 25.1 inches; and shrubs 23.6 to 25.5 inches. On the Black Mesa in Colorado, aspen used 20 inches of water, spruce 14 inches, and grassland 8.3 inches from June to October. Similar information has recently become available for ponderosa pine and juniper watersheds in Arizona, and red fir in central California. In the South Dakota Black Hills average use of water by evapotranspiration showed an increasing trend over a 27-year period, possibly due to the increasing density of second-growth ponderosa pine.

Recreation Research

Research Center established at Warren, Pennsylvania. The first forest research center having forest recreation research as a major theme of its program was established at Warren, Pennsylvania. A program for research, dealing with problems of managing and maintaining developed recreation areas has been started.

Estimates of recreation use. Studies to establish a satisfactory unit of recreation use and to develop a method for making reliable estimates of recreation use are underway in California by the Pacific Southwest Forest and Range Experiment Station. This Station is also making a study of the effects of heavy use on campgrounds.

Forest Protection Research (Fire, Insects, Diseases)

Current Activities: This work includes research on the prevention or control of damage from fires, insects, and diseases in forests.

Research on forest fire is directed toward reducing fire losses, improving efficiency of fire prevention and control measures, and toward better techniques for using fire beneficially in forest and range management. Human attitude and behavior studies are laying the groundwork for improved fire prevention methods. Studies of thunderstorms and ways to reduce their fire-starting lightning discharges are continuing. How to predict fire behavior more reliably for better and safer fire fighting is being developed through intensive study of environmental factors that control the ways fire burns. New chemicals and other additives to water that improve its fire fighting efficiency are being developed and tested. Also under study are fire effects and how to achieve best results from fire use for hazard reduction--including slash disposal, modification or control of vegetation, seed bed preparation and other purposes.

Research on forest insects is directed toward the prevention or control of destructive insect attack on forests and forest products. Damage by insects enters into all phases of forest management from the seed to the mature forest. The development of effective and economical methods of direct and indirect control is dependent upon thorough knowledge of life histories and habits of forest insects, including the interrelationships between the insects and their environments. Investigations on direct control methods involve mechanical and chemical methods. Research on improvement of insect survey methods with particular emphasis on use of aerial photographs is an important phase of the work. Control of forest insects by indirect methods such as the use of natural or introduced predators and diseases of insects, and by silvicultural practices designed to prevent the buildup of insect epidemics, offers promise and is being emphasized in the research program.

Research on diseases in forests, forest tree nurseries, and on decays and stains of forest products provides the basic information on the causes of diseases and on practicable and effective methods of combating them. Studies are underway on the identification and life history of the pathogens that cause disease, on the environmental conditions that result in disease epidemics in forests, on direct control by chemical and mechanical methods, on indirect control through silvicultural practices and genetic resistance, and on the improvement of disease survey techniques. In the products field, research is directed to the determination of methods of handling logs and lumber to prevent fungus infection; of the proper use of naturally durable or treated wood in high-hazard locations; and of improved structural design to reduce decay of wood in service.

Selected Examples of Recent Progress

Forest Fire Research

New method for measuring thermal conductivity of bark. A key factor in fire killing of timber is the insulating capacity of the bark of species burned. But no standard technique has been available for

measuring thermal conductivity of the bark. In a method recently developed in cooperation with Yale University, a probe of a very small diameter is embedded in the bark and heated a few degrees by a low electric current. The rate at which this heating takes place is related to the conductivity of the surrounding bark. Using this device, thermal conductivity and other values can now be determined to shed light on apparent differences in insulating properties of bark of various species, information that is needed to predict damage to trees from fires of known intensity, and hence to more accurately evaluate fire damage in stands remaining after fire.

Temperatures measured in controlled burns. Although the use of prescribed burning as a hazard reduction tool has become widely adopted in the southeastern Coastal Plain, little has been known of temperatures generated in such fires. This is of considerable importance in view of the need to keep fires "cool" enough to avoid damage to pine timber. Preliminary trials in dense palmetto-gallberry growth in south Georgia revealed heat peaks one foot above the ground of 1600°F. for summer head fires as contrasted to 600°F. for the more desirable controlled backfires. Similar studies in the Piedmont where prescribed burning has been viewed with considerable apprehension by most forest owners, showed peaks of 1000°F. and 500°F. for head- and back-fires.

New field evidence of prescribed burning effectiveness. The importance and effectiveness of periodic prescribed burning in reducing the number and size of wildfires in the southeast is given support by another study just completed. Nearly a million acres of forest land in south Georgia and north Florida were used in the study area. The entire area was delineated and classified according to age of "rough" (the accumulation of brush, grass, pine needles and other fuel) for each year from 1955 to 1958. Considering all wildfires in the study area during this period, a higher occurrence rate was indicated for roughs 3 years and older, although the difference was not large. On the other hand, burned acreage increased rapidly from about 5 acres per 1,000 acres for roughs of 3 years and less to 13 acres for 5-year roughs and 726 acres per 10,000 acres for roughs older than 5 years. Twelve fires over 200 acres in size all burned in roughs older than 5 years.

New fire-spread data from model fires for better control. Sound knowledge of fuel and heat relationships involved in free-burning fires is one of the foundation stones on which better control methods are built. From experimental free-burning fires in wood cribs at Berkeley, California, it was learned that the rate of fire spread through the crib was inversely related to wood density. It was also determined that rate of spread increased as the size of the fuel (diameter of the sticks) decreased from 3/4 inch, but with coarser fuel--from 3/4 to 1-1/4 inches--increase in thickness had no effect.

Fire danger rating equipment is modernized. A project to modernize and develop new equipment and instruments for fire-danger rating purposes has produced a number of new instruments. Development work on all items has been completed. Specifications are published for an aluminum rain gauge and plastic measuring stick, wind counter, and belt weather kit. Specifications are forthcoming for an electric fan psychrometer assembly. Plans are complete for an aluminum knockdown instrument shelter. Testing last summer of a photographic recording fire-weather station proved the system successful. An automatic recording fire-weather station was tested during winter conditions and all components found adequate; a power source to last more than two weeks without recharging is now being sought. This is a cooperative research project between the Forest Service and the Weather Bureau.

Damage from borate slurry studied. While the effectiveness of some of the newly developed chemical fire retardants is very good, experiments and observations designed to pick up possible adverse effects on soil or vegetation have been maintained. Sodium calcium borate is a retardant which is capable of causing damage. In Louisiana where this chemical was used experimentally for fire line construction, damage to vegetation continued through the second year after application. In Maryland borate drops from an aerial tanker controlled a slash fire but killed Virginia pine seed trees in the drop area. And in the southeast final results from a borate toxicity study substantiated preliminary findings that the chemical is capable of killing pine seedlings and preventing seed germination. Longleaf pine sawtimber trees in the center of a drop pattern were also killed. These and other similar studies indicate the need not only for care and judgment in the use of borate slurry as a fire retardant but also give emphasis to the search for non-toxic fire retardants.

Forest Insect Research

Insecticidal control of bark beetles. Recent research in California has shown that application of a 0.2 percent solution of lindane to the bark of pines is effective in controlling one of the destructive bark beetles. A 0.4 percent solution of the material also gave almost 90 percent control of the mountain pine beetle.

Progress is being made in recently-initiated studies of disease-causing organisms affecting bark beetles. A species of fungus has been isolated from the western pine beetle and a species of *Penicilium* from the Engelmann spruce beetle. *Bacillus thuringiensis* has also been isolated from these bark beetle species. Disease caused by these organisms may be effective in preventing or controlling outbreaks.

Relation of mortality of Black Hills beetle to population trends. Recent studies in the Rocky Mountains have shown that infestations of the Black Hills beetle can increase even where the mortality of broods from the egg to adult stages is in excess of 90 percent. Where mortality ran as high as 97 percent infestations were static - neither increasing or declining. Declining infestations occurred only where brood mortality reached 99 percent.

Temporary effect of aerial application of DDT sprays on spruce budworm parasites. Studies in Oregon have shown that while large numbers of spruce budworm parasites may be killed when DDT sprays are applied to spruce budworm infested stands, the effect is only transitory. In such stands, budworm parasite populations have returned to normal within a year.

Studies in the behavior of parasitized and non-parasitized spruce budworm larvae revealed that when they are exposed to identical sources of light the non-parasitized ones tend to move toward the light; whereas parasitized ones either move away from it, or do not react to it at all. It is expected that this finding will result in the development of improved methods of sampling budworm larval populations; also in determining percentages of larval parasitization.

Gypsy moth disease studies show need for heavier virus control treatment. Studies in the laboratory have shown that first instar larvae of the gypsy moth died in 10 days when fed on foliage that had been treated with the virus Borrelina reprimens. Older larvae lived for 14 days when fed on such foliage. Indications are that it will be necessary to apply a much heavier dosage to control the gypsy moth in the field.

The red oak borer appears to be the most important hardwood borer in the Central States region. It is not only highly destructive itself but it also appears to create conditions in trees which make them more susceptible to attack by two other species of destructive borers. Red oak borer larvae apparently are able to survive in infested trees that are felled or poisoned during the fall that precedes the year of their emergence.

Dipping for protection of cottonwood cuttings from insect attack. Studies in Mississippi revealed that by dipping cottonwood cuttings for one-half their length in Thimet-carbon dust prior to planting, attacks by the cottonwood twig borer, two leaf beetles, and a species of root and stem borer were prevented for 6 months. During this period the cuttings grew to heights of 12-14 feet.

A simple and rapid method for sampling European pine shoot moth populations. Recent studies have shown that a distinct relationship exists between the proportion of pine trees in a plantation having European pine shoot moth-infested leaders and the number of insects per tree. This permits the determination of the shoot moth population simply by counting the number of infested leaders, a much easier and quicker method than has been available up to now.

Helicopter makes more thorough Engelmann spruce beetle surveys possible. Recent studies in the Rocky Mountains have shown that Engelmann spruce beetle infestations can be detected and evaluated from a helicopter. Because of the capacity of this type of aircraft for flying slowly and at low levels above the tree tops, observers could detect small infestations that could not be detected from fixed-wing aircraft. An added advantage of the helicopter was the fact that it could be flown up steep, narrow drainages, and over high ridges between drainages, without having to circle to gain altitude.

Forest Disease Research

Oak wilt infected bolts have been successfully sterilized by chemical fumigation in laboratory experiments. This suggests the possibility of rendering oak logs and lumber cut from wilt trees safe for export, thereby recapturing markets now lost because of foreign embargoes. The fumigation of logs using a simple polyethylene cover appears possible and would be far more practical than heat treating or kiln drying.

Soft rot fungi are much more prevalent and destructive than previously realized. This was revealed by extensive isolations made from redwood cooling towers, from below-ground portions of posts and stakes, and from "weathered" wood above ground. Many species were found, all differing taxonomically and physiologically from the ordinary wood destroying fungi. Their peculiar physiological characteristics may explain some of the special adaptations permitting them to be destructive under conditions generally considered unfavorable for fungus activity.

New information on the nature of the enzymes involved in decay action of specific white and brown rot fungi has helped explain their effect on wood properties. Strength, pulp yields, dimensional stability, solubility, and surface appearance of white- and brown-rotted wood are closely related to differences in enzymatic capacity of the two fungi. A comprehensive chemical study of sweetgum sapwood in progressive stages of decay, supplemented by observations with the electron microscope, resulted in these findings.

The white pine blight complex in the southern Appalachians is now known to be made up of at least six components: two fungus diseases, two probably due to fumes, one to insects, and one of unknown origin. The distribution pattern about several soft-coal steam plants shows a definite relation between the damage and stack gas plumes. Analytical work has failed to indicate sulphur dioxide or fluorine but indications are that ozone may be the damaging factor.

Diagnosis of a disease, in forest pathology as in human pathology, is usually the first necessary step toward its cure. The causal organisms of two ailments of forest trees were identified. A crown deterioration of western white pine has been proven to be caused by the combined activities of two different fungi. Two species of aphids are also associated with the deterioration. Pecky decay of cypress is now known to be caused by Stereum taxodi, a newly described fungus, rather than by another disease causing organism as previously assumed. Studies of the characteristics of fungi grown in pure culture in the laboratory played a major role in correcting this fallacy.

Pulp chips in outdoor storage can deteriorate rapidly if not fresh when placed in storage. Both southern pine and hardwood chips were observed for 6 months in outdoor storage in Texas and Florida.

Deterioration was heaviest in hardwood chips. Microflora developing in pine chips varied enormously in different parts of the same pile and may account for some of the observed variations in chip appearance.

Cone rust damage is more serious in north central Florida than elsewhere within the commercial range of slash pine in Florida and Georgia. The abrupt drop in the incidence of this seed-destroying disease in south Georgia coincides very closely with the northern limits of live oak, one of the most important alternate hosts of cone rust.

Forest Products Utilization Research

Current Activities: The aim of the forest products research program centered at the Forest Products Laboratory and with field projects at the various regional forest and range experiment stations, is to contribute to the solution of national, regional, and local utilization problems of all types; to increase efficiency in harvesting timber crops; to reduce unused woods and mill residues to a minimum by finding uses for present residues; to develop new products; and to improve the serviceability and lower the costs of existing products. Its broad aim, in brief, is to develop new utilization outlets for thinnings, unpopular and little used species of timber, logging and milling residues, and to make the whole timber crop on farms and other forest lands go further and give better service in a wide variety of uses for lumber, paper, chemicals, and other products derived from wood.

Selected Examples of Recent Progress

Forest Products Utilization Research

Sandwich paneled house passes test of time. A new publication of the Forest Products Laboratory gives results of twelve years experience with sandwich panel design for prefabricated house construction. Important facts developed are (1) the sandwich panels are satisfactory for house construction, having more than enough strength for this use, (2) the panels, especially those using honey-comb core, have excellent insulating properties. Experience with these two factors alone should lead to increased use of sandwich panels in house construction.

New use for hardboard sheathing. Continually seeking ways to reduce costs in house construction, researchers at the Forest Products Laboratory found that a high-density insulating board can be substituted safely for plywood roof sheathing within certain limitations. In cooperation with two hardboard manufacturers, an investigation was conducted at the Lab on material that was recently developed for use where structural strength is more important than thermal insulation. It has already found acceptance as wall sheathing in wood-frame house construction. The material evaluated was one-half inch thick with a density of 25 pounds per cubic foot as compared with most insulation board which is 25/32 of an inch thick with a density of around 18 pounds per cubic foot. Results of the investigation disclosed that,

while not quite measuring up to plywood in every respect, the high-density insulating board satisfactorily meets Federal Housing Administration requirements as roof sheathing when used with framing spaced at 16 inches on center. Its performance fell considerably short of the FHA minimum requirements, however, when used with framing spaced at 24 inches on center.

Stability of overlaid particle board, hardboard, and plywood. Investigations of the dimensional stability of particle board, hardboard, and plywood panels overlaid with paper showed that the overlays appeared to influence warping less than did core construction and thickness. Panels with balanced overlays, however, were flatter than those with unbalanced construction. The panels with plywood cores showed least shrinkage and swelling, followed by panels with cores of particle board and hardboard.

Service tests of treated wood siding. Cooperative investigations made at the Forest Products Laboratory in 1952 demonstrated that dipping wood siding in a water-repellent preservative effectively stopped capillary movements of surface water through horizontal lap joints and vertical butt joints.

Subsequent studies on western softwood siding showed that the use of a water-repellent preservative was a major factor in retarding the blistering of paint caused by water entry from the exterior, but that the preservative did not necessarily prevent blistering caused by cold-weather condensation.

Solar-heated predryer improves operating efficiency. Further study of the solar-heated predryer, which utilizes the sun's energy to remove moisture from lumber, has resulted in modifications that have improved its drying efficiency and reduced operating costs. The unit is believed to be the first of its kind in the world. It is designed to dry lumber in a shorter time than is required by air drying, and at less expense than in a conventional dry kiln.

A dry kiln load of 4" x 4" red oak lumber recently reached a moisture content of 25.3 percent after only 22 days in the solar-heated predryer. Similar lumber drying in the yard required 51 days to reach the same moisture content. Results of this trial run showed a saving of 29 days of drying time and 48 cents per thousand board feet per day.

Surface checking of lumber radically reduced. The Forest Products Laboratory has definitely established the usefulness of the wax-like chemical polyethylene glycol-1000 in stabilizing wood so that differences between dimensions when green and dimensions when seasoned for use are greatly lessened. Recent experiments have shown that this material is an effective control of objectionable surface checking that occurs in the seasoning process. These minor breaks in the board surface occur because of a differential rate of shrinkage. The outside of the board in drying shrinks over a green core and the forces are often great enough to rupture the wood. Northern red oak, a species

quite susceptible to surface checking, was soaked for three days in a PEG-1000 solution. When dried the lumber that was treated had from 1/5 to 1/10 of the checking that occurred on untreated boards. When soaked for 10 days no surface checks developed at all.

Patent for cyanoethylation of wood. A radically new method of protecting wood from decay fungi has been developed and patented. The method consists of treating wood with an aqueous solution of acrylonitrile and an alkali, such as ammonium, and then steaming the impregnated wood. The cellulose is converted to cyanoethyl ether of cellulose, which is immune to decomposition by enzymes secreted by fungi. Unlike older successful methods of wood preservation, which are based on the impregnation of wood with chemicals poisonous to fungi, insects, and other organisms, this new treatment is nontoxic to fungi.

Slicing redwood veneer. While experiments made some years ago demonstrated that it is difficult to manufacture redwood veneer of consistently good quality by rotary cutting, more recent research has disclosed that veneer of uniformly good quality from 1/40 to 7/16 inch thick can be produced by quarter slicing. Some of the 1/40-inch material was used as face veneer on demonstration panels, and the 7/16-inch veneer was utilized to make decorative fences. These fences are in good condition after a year of exposure.

Improved veneer quality. Decrease in quality of Douglas-fir logs has led to increased losses in quality and quantity of products when logs are converted to veneer. Studies completed at the Forest Products Laboratory show that smaller, coarser textured, and knottier logs properly heated before peeling can produce smoother and tighter veneer than unheated logs. This know-how means increased yields of profitable face grades and an addition to the raw material supply for this industry.

New type of wood flooring. A new type of wood flooring that features a unique locking device and permanent colors has been developed. A highly decorative and colorful effect is obtained by exposing the end grain of assorted species of wood that have been treated with various chemicals, dyes, or stains. Either solid or laminated wood can be used. Laminated wood permits the utilization of low-grade, low-cost lumber of nominal thickness, and short lengths otherwise wasted. Steps have been initiated to obtain a patent with the patent rights dedicated to the public.

Since end-grain blocks are difficult to bond to a subfloor, a locking device was designed for securing the unit pieces of flooring to one another to form a continuous smooth and uniform surface. Each unit block or section is fastened to adjacent ones on all four sides. The flooring can be laid in individual sections of convenient size, such as 6 by 6 inches or 4 by 4 inches. It is possible to reduce laying time and costs by prejoining the small sections to form units up to 2 by 2 feet in size before laying.

Quality of glue joints in laminated members determined more quickly. The use of laminated wood members, the principles of which have been studied intensively at the Forest Products Laboratory, is expanding rapidly and offers a means for maintaining the competitive position of wood in the structural field. To insure that gluelines in laminated members intended for exterior use will be uniform and dependable, standard test methods were developed at the Laboratory more than a decade ago. These methods required about 12 days. A newly developed acceptance test method that requires only 3 hours has proved to be as accurate as the old 288 hour test. This will greatly improve the practicality of adequate performance control in the laminating process. The Navy has already adopted the new test for use on a trial basis in laboratories that test laminated oak for the Navy.

New uses found for waste news pulp. With a dual-role objective of conserving raw materials and utilizing waste products, staff personnel at the Forest Products Laboratory, in cooperation with a California paper manufacturer, found it feasible to make newsprint paper from waste news pulp from which the ink was completely removed. A series of trial runs, using the deinked waste pulp supplied by the cooperator, produced a sheet that met newsprint specifications in all respects except for color. Because of this exception, a bleaching treatment that brought the brightness of the sheet up to standard was included in the process.

Brighter unbleached sulfate pulps. A considerable amount of unbleached sulfate pulp is used in making brown wrapping papers, bags, and outside liners of shipping containers. However, sulfate pulp is dark in color--whereas merchandisers prefer the appearance of lighter colored wrappers, as well as the improved printing qualities. In an attempt to get lighter colored papers without bleaching, a series of experimental sulfate digestions was made on red oak and ponderosa pine. No improvement could be obtained in the ponderosa pine pulp but red oak pulp at the same yield as the one above was considerably brighter. In addition, it had strength values as good as, or better than, the conventionally made pulp of the same yield.

Forest Resources Research

Current Activities: This work includes the nationwide Forest Survey, research relating to the marketing of timber products, and investigations of the economics of timber production.

Forest Survey. The nationwide forest survey provides basic forest resource facts by States or counties on the character and condition of forest land; the volume, quality, and location of standing timber; rates of timber growth and natural losses; the amount and kind of timber cut for forest products; and national consumption and prospective requirements for timber products. This information provides a basis for policies and action programs of public forestry agencies, forest industries, landowners, and many others having direct interests in forest resources.

Forest Products Marketing. Research in the marketing of forest products includes studies to increase the efficiency of harvesting, grading, selling, and distributing forest products, improved methods for providing price and market information for timber products, and development of expended markets for timber species and materials in surplus supply. Such marketing investigations are of particular importance to the several million owners of farms and other small forest properties.

Forest Production Economics Research. Investigations of the economic aspects of forestry enterprises provide information on the profitability of producing various timber crops in different areas, the effect of ownership, taxation, and other economic factors on the practice of forestry, and possible means of reducing financial and economic obstacles to the growing and harvesting of forest crops. These studies thus provide economic guidelines for forest owners and timber industries, and in conjunction with other resource investigations furnish part of the facts needed for development of national and local forestry programs.

Selected Examples of Recent Progress

Forest Survey

Additional 59 million acres surveyed. Forest surveys conducted in 15 States during the past year covered 59 million acres of forest land to determine the area, location and condition of the Nation's forest resources, timber volumes, rates of timber growth and mortality, and timber cut by forest industries. Except for the interior of Alaska, essentially all 775 million acres of forest land in the United States have now been inventoried at least once.

Low-quality hardwoods increasing in Virginia. As an example of recent Forest Survey findings, it is now known that low-quality hardwoods are increasing and replacing pine over wide areas in Virginia. This is offset in part by hardwood control and planting of pine and by natural seeding-in of pine on abandoned farm land. As a result of these conflicting trends, the pine resource currently is just about holding its own. Virginia's forests have the capacity to grow 50 to 75 percent more timber, but to realize this potential will require removal of low-quality hardwoods on several million acres to make room for pine and better hardwoods. Planting on much of this area and on about 1.5 million acres of abandoned cropland also will be essential to achieve this goal.

Small forest holdings characteristic in Iowa. Forest lands in Iowa total about 2.6 million acres, or seven percent of the total land area. Farmers own most of the forest land in woodlands that average about 45 acres in size. These forests contain about 5.1 billion board feet of sawtimber consisting almost entirely of hardwood species. The volume and quality of timber grown in Iowa could be greatly improved by widespread application of better management practices, although this is made difficult by the small size of most forest tracts and by inadequate marketing facilities.

Future timber requirements studied. As part of a continuing program of potential timber requirements studies, field work was completed on a nationwide study of wood used by transportation industries. Comprehensive information on amount and kind of wood used in FHA-financed residential construction was obtained in a nationwide sample. A pilot study of wood use on farms and rural areas in Missouri was completed with publication of results now in process. Other cooperative studies are obtaining information on use of wood and competing materials in nonresidential construction and in manufacturing industries.

Improved survey techniques developed. Procedures and tables for estimating cull in standing trees were developed in the South. The volume of cull in hardwood butt logs, for example, was found to be related to length of externally visible fire scars, which are the primary entrance points for heart-rot fungi. Other research on growth projection methods has provided ways of evaluating long-range implications of current trends in forest conditions and timber use.

A test of the potentialities of helicopters for obtaining low-altitude stereo-photography, made in cooperation with the Tennessee Valley Authority, indicated that helicopter stereograms generally were superior to 1:20,000 photos for evaluating average tree heights and crown diameter, but not sufficiently superior to justify the high cost of helicopter operation.

Forest Products Marketing Research

Weight scaling of saw logs. Studies of the possibilities of scaling southern pine saw logs by weight showed that lumber yields were more closely estimated by weighing logs than by scaling with conventional log rules. Weighing logs by truckloads promises substantial savings in time and money and a more equitable basis for payment than now exists in many areas.

Forest development opportunities in Colorado. Initial findings of a study of opportunities for pulp and paper mills in Colorado indicated that some 27 million cords of pulpwood from dead spruce, lodgepole pine and aspen are available, that stump-to-truck costs compare favorably with those in competing areas, that existing roads represent 20 percent of the needed road system, and that Colorado River water requires only minor treatment for pulp and paper production.

Timber quality standards. As part of a comprehensive program of log and tree grade studies, an electronic computer program was developed for handling a number of complex and time-consuming statistical operations designed to express timber quality in terms of quantity or value of finished products. Included was the conversion of data on rough green to surfaced dry lumber, calculation of total volumes of surfaced dry lumber recovered from logs and trees, and computation of the value of individual logs under any given lumber grade-price situation.

Forest Production Economics Research

Economics of timber growing. A study of comparative investment opportunities for increasing timber production in Pennsylvania by various forestry practices indicated that thinning of certain poletimber stands was the most profitable opportunity for increasing timber yields in that State. Prospective returns from this practice exceed potential net returns from such other practices as planting of softwoods on open or lightly stocked lands and cull tree removal in hardwood seedling and sapling stands. Although initial investments could best be devoted to thinning for production of timber at minimum costs, other practices also appeared profitable in many areas. It was estimated that more than $70 million could be profitably invested in the State in the various practices analyzed.

Economics of forest protection. A recent publication, "The Economics of White Pine Blister Rust Control in the Lake States," provides detailed guides for field use in appraising the profitability of rust control and alternative management measures in individual white pine stands. By indicating the relative profitability of rust control opportunities in various sections of the Lake States region the study also has provided a practical basis for allotting available rust control funds to areas that will return the greatest benefits from such investments.

As part of a similar study initiated in the Northeast, procedures were developed to determine white pine volume losses caused by weevil injury. A regression of volume loss in relation to tree size and number and position of weevil injuries has provided a formula for estimating the losses that can be expected from weevil attack in particular white pine stands.

Research Construction

The research construction program authorized by the Congress in fiscal year 1959 at seven locations was completed. The largest structure is the Northern Forest Fire Research Laboratory at Missoula, Montana, which was formally dedicated in September, 1960. Laboratory facilities for advanced basic research are also being provided in the field of forest genetics at Rhinelander, Wisconsin, Gulfport, Mississippi, and Placerville, California. A forest biology laboratory devoted to forest insect and disease research is now occupied by scientists at Delaware, Ohio. At Lake City, Florida, Rapid City, South Dakota, and Grand Rapids, Minnesota, new office-laboratories will greatly strengthen combined applied and basic research efforts.

STATE AND PRIVATE FORESTRY COOPERATION

Current Activities: This program, for the most part carried on in cooperation with the States, encourages private timber growing through assistance in preventing and suppressing forest fires, reforestation of denuded and poorly stocked areas, and good management of woodlands. Privately owned forest lands comprise three-fourths of the Nation's commercial forest area and produce 85% of all timber cut. The fire control program applies to all State and private forest lands within the boundaries of organized protection units. The balance of the program is concentrated on small forest properties in private ownership because (a) more than half of the commercial forest acreage is in small holdings averaging only about 60 acres each, (b) the small-owner group comprises 99% of private forest owners, and (c) present cutting practices are poorest on these small properties.

Recent Progress and Trends

Cooperative Forest Fire Control

The year 1959 was one of a reversal of the general downward trend of recent years in the number of forest fires and area burned. In relation to 1958 there was an increase of only 4% in the number of fires, but 43% increase in the area burned on protected lands. A severe spring season in the eastern half of the nation accounted for most of the increase in burned area.

Although the unprotected area was reduced by about 2.4 million acres, and is now 34 million acres, almost 50% of the total burn of 3.3 million acres was on this unprotected area.

Expenditures by the States and private land owners in this program have increased on an average of about $3 million a year during the past five years. During this same period Federal financial participation remained about constant.

To establish a sounder statistical basis as an aid to the program a change is contemplated in the compilation of fire data at the national level. Proposals for the collection and reporting of these data by states cooperating in the program have been presented to State Foresters at national and local meetings. This action is in accord with a recommendation of the Battelle Report.

During 1959 Wyoming requested Federal cooperation in the forest fire program. The agreement for this cooperation was executed effective July 1, 1959. Wyoming is the 47th state participating in the program.

Technical services are provided in all phases of forest fire protection. Special emphasis is on equipment development and procurement, fire weather data, interstate compact training, and fire prevention techniques.

The following table shows State allotments and expenditures for cooperation in forest fire control:

	State and Private Funds Expended, F. Y. 1960	Federal Allotments, FY 1961 1/
Alabama	$1,036,909	$327,300
Alaska	- -	30,000
Arkansas	890,396	276,200
California	14,201,962	1,144,000
Colorado	86,023	32,900
Connecticut	139,923	42,600
Delaware	12,351	15,500
Florida	3,046,974	544,100
Georgia	2,460,299	496,000
Hawaii	19,768	15,600
Idaho	603,950	153,700
Illinois	147,147	50,400
Indiana	110,845	46,600
Iowa	34,209	30,000
Kentucky	387,563	145,100
Louisiana	1,518,815	331,800
Maine	905,062	234,500
Maryland	513,916	114,000
Massachusetts	388,486	109,800
Michigan	1,860,729	399,400
Minnesota	853,035	270,900
Mississippi	1,475,404	346,700
Missouri	701,523	207,700
Montana	314,417	105,500
Nebraska	5,000	5,000
Nevada	153,519	32,300
New Hampshire	198,023	75,900
New Jersey	412,060	101,400
New Mexico	43,993	30,000
New York	1,076,968	218,500
North Carolina	1,304,296	310,700
North Dakota	5,844	8,000
Ohio	292,909	87,300
Oklahoma	160,826	130,700
Oregon	2,735,996	522,700
Pennsylvania	767,014	188,200
Rhode Island	95,931	35,800
South Carolina	1,160,993	297,200
South Dakota	49,481	30,000
Tennessee	867,867	267,200
Texas	636,447	251,400
Utah	75,713	32,600
Vermont	59,820	30,000
Virginia	894,603	269,000
Washington	2,634,530	527,900
West Virginia	314,939	123,100
Wisconsin	1,588,394	319,800
Wyoming	6,406	10,000
Administration, Inspection, Prevention, and Special Services to States	- -	712,500
Grand totals	47,251,278	10,087,500

1/ While the amount available to a State may, if the allotment is small, exceed previous expenditures by that State, the actual payment to a State never exceeds State and private funds expended by or under the control of the State.

Cooperative Tree Planting

The furnishing of forest and shelterbelt tree planting stock for planting on privately-owned and non-Federal public land, authorized by Section 4 of the Clarke-McNary Act, continued in fiscal year 1960 to be an important feature in the forestation of land in need of planting. This work is carried out through cooperative agreements with the State Foresters in 45 States and Puerto Rico and the State colleges in three States.

The number of trees shipped to landowners during each of the past 5 fiscal years in comparison with all forest and shelterbelt trees produced by public and private nurseries is as follows:

Year	State Cooperative Program	Other State Distributions	Total Output All Nurseries
1956	560,456,000	47,673,000	885,968,000
1957	712,272,000	114,834,000	1,101,471,000
1958	764,364,000	377,274,000	1,554,692,000
1959	945,464,000	630,766,000	2,080,122,000
1960	1,000,000,000 (est.)	800,000,000 (est.)	2,450,000,000 (est.)

The substantial increase in the State distribution other than for the Cooperative program in 1958, 1959, and 1960 is due to the production of trees under agreements with the Forest Service for use in the Conservation Reserve of the Soil Bank. The peak production for this program was reached in 1960. There will be a large reduction in this item for fiscal year 1961 with a corresponding reduction in the total number of trees produced in that year. A still greater reduction in total volume of trees available for planting primarily from State forestry agency sources is anticipated for F.Y. 1962.

Cooperative Forest Management and Processing

The following tabulation shows the accomplishments in the Cooperative Forest Management programs for the fiscal year 1960:

Activity	Unit	Accomplishment
Owners given woodland management assistance ...	Number	82,188
Area receiving management assistance	Acres	4,115,612
Timber products sold or harvested	M.B.F.[a/]	596,178
Value of timber products sold or harvested	Dollars	14,082,709
Young timber saved from premature harvest	Acres	236,008
Owners referred to consulting foresters for additional assistance	Number	1,225
Area involved in above referral	Acres	619,825

[a/] Thousand Board Feet

This program now has 46 States and Puerto Rico cooperating. Only Alaska, Arizona, Hawaii, and Wyoming do not provide farm forestry service. In fiscal year 1960 the program cost the States $2,484,411. The Federal Government's share in the cooperative program was $1,542,300.

In 1960 there were 531 "service" or "farm foresters" working on the program and technical assistance was provided to 82,188 woodland owners as shown in the table.

This program is becoming increasingly popular with the small forest landowners, and in spite of increased State appropriations, the existing force is unable to keep up with present requests for assistance.

General Forestry Assistance

The Forest Service continued to give specialized forest management assistance to the Defense Department and to other Federal and State agencies, and to the Congress, forest industries, consultants and forest schools, by a few specialists working out of Forest Service Regional Offices, and in close coordination with State Foresters.

On privately owned forest lands, an informal check showed that over 25 million acres are now covered by a continuous forest inventory system - a system promoted by the Forest Service, using machine calculating procedures.

Work in rural development areas continued. In these areas where there is a surplus of timber and labor, new forest industries are being encouraged. Agriculture Information Bulletin No. 222 - Forest Industry Opportunities in Rural Development - was released. This states that for every dollar the timber owner gets for his stumpage, an average of $17.60 more value is added to the original worth of the wood by the time it reaches the ultimate consumer.

(b) Forest Roads and Trails

Appropriation Act, 1961 and base for 1962	$30,000,000
Revised Budget Estimate, 1962	38,000,000
Increase:	
Original Budget Estimate	+5,000,000
Budget Amendment	+3,000,000
Total increase	+8,000,000

This appropriation provides for the liquidation of obligations incurred for the construction and maintenance of forest roads and trails pursuant to the authorization contained in the Federal Highway Acts of 1958 and 1960. Roads and trails are essential to protection and management of national forests, and utilization of their resources. An appropriation of $38,000,000 for 1962 will provide sufficient cash to liquidate prior year obligations and obligations planned for fiscal year 1962 which must be paid by June 30, 1962.

Analysis of Cash Requirements by Activities a/

	Actual 1960	Estimated 1961	Revised Estimate 1962	Increase or Decrease
Construction of roads and trails	$20,002,165	$24,936,600	$29,559,200	+$4,622,600
Maintenance of roads and trails	7,821,657	7,502,200	8,440,800	+938,600
Total	27,823,822	32,438,800	38,000,000	+5,561,200

Authorizations for Appropriations a/

Fiscal Year	Construction	Maintenance	Total	Funded	Unfunded
1960	$22,500,000	$7,500,000	$30,000,000	$30,000,000	- -
1961	22,000,000	8,000,000	30,000,000	b/19,336,000	$10,664,000
1962	34,000,000	8,000,000	c/42,000,000	38,000,000	4,000,000
Total	78,500,000	23,500,000	102,000,000	87,336,000	14,664,000

a/ The annual appropriation language and the Department presentation combine the appropriation for "Forest roads and trails" made pursuant to 23 U.S.C.205 and the appropriation of 10% of forest receipts for construction and maintenance of roads and trails pursuant to 16 U.S.C. 501. This merger of funds is made in order to simplify the programming, allotment, and accounting of funds at the field level. Since the accounts for these two funds are merged it is not practicable to distribute obligations and expenditures between the two appropriations on a precise basis. The amounts shown for the "Forest roads and trails" appropriation are a proration based on the percentage that contract authorization used under the appropriated funds is of total available funds. Expenditure amounts for maintenance are based on all such obligations requiring cash payment during the fiscal year in which obligations are incurred.

b/ The 1961 appropriation of $30,000,000 less prior year unfunded authorization of $10,664,000 provided $19,336,000 for funding of the $30,000,000 authorization for 1961.

c/ Consists of $35,000,000 authorization for 1962 plus $7,000,000 of the $40,000,000 authorization for 1963 which is available for obligation in 1962. This is an increase of $12,000,000 over the authorization in fiscal year 1961.

Status of Unfunded Authorizations

Unfunded contract authorizations beginning of 1961	$40,664,000
Appropriation, 1961	-30,000,000
New contract authorization, 1961 (1962 authorization available in 1961--Federal Highway Act of 1960, approved July 14, 1960)	+35,000,000
Balance unfunded as of June 30, 1961	45,664,000
New contract authorization, 1962 (1963 authorization available in 1962--Federal Highway Act of 1960, approved July 14, 1960)	+40,000,000
Total unfunded beginning of 1962	85,664,000
1962 Revised Budget Estimate (cash requirements)	-38,000,000
Balance to remain unfunded as of June 30, 1962	47,664,000

Unfunded balance consists of $14,664,000 obligations for which cash will not be required in 1962, and $33,000,000 contract authorization which will not be obligated in 1962.

Analysis of Cash Requirements

1.	Unliquidated obligations June 30, 1960	$12,683,351
2.	Estimated cash requirements to finance 1961 program	a/19,755,391
3.	Total cash requirements by June 30, 1961	32,438,742
4.	Less cash on hand 1961	-32,412,260
5.	Cash balance from 1961 available for use in 1962	+26,482
6.	Obligations in 1962 for which cash was not provided in line 2	10,637,518
7.	Estimated cash required to finance 1962 program	b/27,336,000
8.	Total cash required for 1962	38,000,000

a/ Based on 65% of new obligations (totaling $30,392,909) requiring cash payments during the fiscal year. This percentage is approximately in line with rate of cash payments in past years.

b/ Based on 65% of $42,000,000 of new obligations, or $27,300,000, but increased by $36,000 to provide rounded appropriation.

The following tabulation reflects the total program for the construction and maintenance of roads and trails on the national forests by combining the funds available under the appropriation "Forest roads and trails" with the permanent appropriation of 10% of national forest receipts. This permanent appropriation for Roads and trails for States (10% fund) is estimated at $11,370,000 for 1962 compared with $14,170,000 for 1961, a decrease of $2,800,000.

(Revised)

PROJECT STATEMENT

Project	1960	1961 Estimate	Increase or Decrease: Original Estimate	Increase or Decrease: Budget Amendment	1962 Revised Budget
1. Construction of roads and trails	$31,070,453	$33,562,909	+$4,307,091	+$4,500,000	$42,370,000
2. Maintenance of roads and trails	10,905,386	11,000,000	- -	- -	11,000,000
Total pay act costs (P.L. 86-568)	[- -]	[1,345,137]	[- -]	[- -]	[1,345,137]
Total obligations	41,975,839	44,562,909	+4,307,091	+4,500,000	53,370,000
Transfer from "Roads and trails for States"	-11,869,555	-14,170,000	+2,800,000	- -	-11,370,000
Program under "Forest roads and trails" contract authorization	30,106,284	30,392,909	+7,107,091	+4,500,000	42,000,000
Obligations incurred under unfunded contract authorization	-2,106,284	-392,909	-2,107,091	-1,500,000	-4,000,000
Total appropriation or estimate	28,000,000	30,000,000	+5,000,000(1)	+3,000,000(1)	38,000,000

INCREASE

(1) An increase of $8 million ($5 million in the original budget and $3 million in the budget amendment) to meet cash requirements for liquidation of contract authorization. This additional cash is required to:

a. Pay for obligations of the prior year which will be due for payment in fiscal year 1962, and

b. Pay the portion of 1962 obligations of $42 million contract authorizations which will require cash payment in that year.

The net increase of $8,807,100 in obligations for construction of forest roads and trails consists of an increase of $12,000,000 in obligations of new contract authorization in 1962 offset by $392,900, the available contract authorization which was not obligated in 1960 but is planned for obligation in 1961, and a decrease of $2,800,000 in funds available from the permanent appropriation -- Roads and trails for States (10% fund).

The increase of $12 million in obligation of new contract authorization in 1962 will be used for the construction and reconstruction of roads, trails, and bridges needed as an essential part of Operation Multiple Use--the Program for the National Forests, which has been explained in the justification of increase under the appropriation Forest Protection and Utilization. The increase will place the road and trail portion of the Program almost to the level originally planned for the second year.

Part of the increase will be used to start an accelerated program for the acquisition of rights-of-way. Rising land values have increased the need for speeding up the procurement of rights-of-way and also the difficulty and cost of obtaining them. More lead time is needed to keep the acquisition program ahead of the road construction program. By getting an increase of approximately 500 parcels per year for the next three years the schedule of rights-of-way procurement in relation to the road construction schedule required for timber sales and the multiple-use program will permit a fully coordinated access program to go forward without delays for rights-of-way.

About $3.3 million of the increase will be used for supplementary construction and engineering on some of the 4,200 miles of roads scheduled for construction by purchasers of national forest timber during the fiscal year. This will provide for these roads the permanent drainage structures, the engineering supervision of construction, and the additional road capacity needed for multiple-use management and permanent service to all resources of the national forests.

The remaining $8.7 million will be used for acquisition of rights-of-way and the construction and reconstruction of roads, trails, and bridges by the Government as follows:

Rights-of-way	500 parcels
Access roads	466 miles
Bridges	30 each
Supplemental foot and horse trails	90 miles

Under 23 U.S.C. 203, authorizations enacted by Congress in the biennial highway authorization acts are available for obligation a year in advance of the year for which authorized.

The Federal Highway Act of 1960, approved July 14, 1960, Public Law 86-657, provides the following authorizations:

Fiscal year 1962	$35,000,000
Fiscal year 1963	40,000,000

In accordance with 23 U.S.C. 203, it is proposed to obligate $7,000,000 of the 1963 authorization in fiscal year 1962, thus making available a total of $42,000,000. This amount is necessary to adequately finance the level of road construction and reconstruction required for the second year of Operation Multiple Use.

STATUS OF PROGRAM

A forest development transportation system consisting of roads and trails is essential to the protection and management of the national forests and utilization of their resources. Under this program the existing system is maintained and additional roads and trails are constructed in order to obtain the maximum practicable yield and use of the resources of the national forests on a continuing basis. As of June 30, 1960 the system consisted of approximately 156,000 miles of earth or surfaced access roads and 108,500 miles of supplemental foot and horse trails.

The transportation system is maintained in part by the Government and in part by State and local road authorities, private cooperators and permittees, and purchasers of Federal timber. The following table shows how the system was maintained in fiscal year 1960:

	Roads	Trails
	(Miles - Estimated)	
Maintained for traffic or cared for and preserved by the Government	94,000	105,000
Maintained for traffic by others	62,000	3,500
Total	156,000	108,500

In fiscal year 1960, $10,905,386 was obligated for maintenance and preservation of the transportation system and $31,070,453 for the construction and reconstruction of access roads and trails. In addition, Federal timber purchasers accomplished reconstruction and construction work on access roads having a value of about $47.4 million.

The construction and reconstruction accomplished on the transportation system in fiscal year 1960 was as follows:

	Units of Work Completed	
	By the Government	By Federal Timber Purchasers
Roads	851 miles	3,841 miles
Trails	142 miles	- -
Bridges	471 each	36 each

(c) Access Roads

Appropriation Act, 1961 and base for 1962	$1,000,000
Budget Estimate, 1962	1,000,000

PROJECT STATEMENT

Project	1960	1961 (estimated)	1962 (estimated)
Access roads	- -	$2,000,000	$1,000,000
Unobligated balance brought forward	- -	-1,000,000	- -
Unobligated balance carried forward	$1,000,000	- -	- -
Appropriation or estimate	1,000,000	1,000,000	1,000,000

STATUS OF PROGRAM

Planned use of these funds is to purchase, or to condemn if reasonable purchase negotiations fail, full or partial interest in existing roads or rights-of-way needed for access to national-forest areas so situated that other means of obtaining access are not practical or would not constitute an efficient expenditure of public funds.

In fiscal year 1961 an interest was acquired in 13.5 miles of heavy duty road at a cost of about $1.8 million, to provide needed access in the Lewis River drainage, Gifford Pinchot National Forest, in the State of Washington. Present plans provide for use of the remaining $200,000 for smaller road acquisitions by June 30, 1961.

IV

(d) Acquisition of Lands for Superior National Forest

Appropriation Act, 1961 and base for 1962	$750,000
Budget Estimate, 1962	250,000
Decrease	-500,000

PROJECT STATEMENT

Project	1960	1961 Estimate	Increase or Decrease	1962 Estimate
Acquisition of lands for Superior National Forest a/	$14,043	$750,799	-$500,799	$250,000
Unobligated balance brought forward	-14,842	-799	/799	- -
Unobligated balance carried forward	799	- -	- -	- -
Total pay act costs (P.L. 86-568)	/- -/	/870/	/- -/	/870/
Appropriation or estimate	- -	750,000	(1)-500,000	250,000

a/ Represents obligations. Applied costs for 1960 are $126,885. The difference of $112,842 represents prior year obligations for purchase of land on which title was cleared in 1960.

DECREASE

(1) The proposed appropriation of $250,000 will complete the authorization of $2.5 million contained in the Act of June 22, 1948 (62 Stat. 568) as amended by the Act of June 22, 1956 (70 Stat. 326). Legislation is being proposed to increase the authorization by $2.0 million to a total of $4.5 million primarily for acquiring the improved tracts within this wilderness area. On approval of the proposed legislation, a supplemental appropriation for 1962 will be required to complete the program contemplated by the additional authorization.

CHANGE IN LANGUAGE

The estimates include proposed change in the language of this item as follows (new language underscored; deleted matter enclosed in brackets):

> For the acquisition of forest land within the Superior National Forest, Minnesota, under the provisions of the Act of June 22, 1948 (62 Stat. 570; 16 U.S.C. 577c-h), as amended, by purchase, condemnation or otherwise, /$750,000/ $250,000, to remain available until expended and to be available without regard to the restriction in the proviso in section 1 of that Act /: Provided, That no part of this appropriation shall be used for the acquisition of any land without the approval of the local government concerned/.

This language change proposes elimination of the requirement for approval of the local government concerned of land acquisitions within the area because such requirement tends to make condemnation authority ineffective.

The basic Act of June 22, 1948 does not require approval by the local government of land acquisitions. This requirement has been included in appropriation language, beginning with the Supplemental Appropriation Act of 1957. Up to this

time, acquisitions have been made on the basis of voluntarily negotiated agreements and there have been no proposals for purchase by the Federal Government within the area which have been opposed by the local government. As the program of consolidation of Federal ownership in this area nears completion, negotiations with the owners become more difficult. In many instances, the owners will not voluntarily agree to sell and condemnation will be necessary. If the language requiring the approval of the local government is not removed, the local governments, by withholding their consent, could effectively block the efforts of the Federal Government to complete the consolidation program and thus defeat the purpose for which the program was initiated.

STATUS OF PROGRAM

This appropriation is for the purchase of land pursuant to the Act of June 22, 1948 (62 Stat. 568), as amended by the Act of June 22, 1956 (70 Stat. 326), to preserve the unique qualities of the remaining wilderness canoe area in the Superior National Forest, Minnesota. The Act of June 22, 1956 extended the area to which the purchase directive applies and authorized additional appropriations.

As a part of this program, about 38,000 acres have been acquired since 1948, of which 16,301 acres were acquired under the authority of the Act of June 22, 1948. Under all authorities, including purchase, exchange and donation, 322,670 acres have been acquired in the Boundary Waters Canoe Area in furtherance of this program.

During fiscal year 1960, a total of 110 acres was approved for acquisition, obligating all but $800 of the $14,800 balance of unobligated funds available from prior years' appropriations.

There remain within this area some 31,100 acres of county-owned and privately-owned land. These privately-owned properties include 13 resort areas, 57 cabin sites, and 86 tracts of unimproved lands.

(e) Acquisition of Lands for National Forests, Special Acts (Cache National Forest)

Appropriation, 1961 and base for 1962	$10,000
Budget Estimate, 1962	10,000

PROJECT STATEMENT
(On basis of available funds)

Project	1960	1961 Estimate	Increase or Decrease	1962 Estimate
Acquisition of lands for Cache National Forest a/	$25,236	$132,401	-$122,401	$10,000
Unobligated balance brought forward	-87,637	-122,401	/122,401	- -
Unobligated balance carried forward	122,401	- -	- -	- -
Appropriation or estimate	60,000	10,000	- -	10,000

a/ Represents obligations. Applied costs for 1960 are $18,460. The difference of $6,776 represents obligations for purchase of land on which title has not been finally cleared.

STATUS OF PROGRAM

Two appropriations are available for acquisition of lands in the Cache National Forest. A $10,000 appropriation is available from national forest receipts when appropriated by Congress. The Act of July 24, 1956 (70 Stat. 632) authorized additional appropriations not exceeding $200,000 for the same purpose. This sum has been appropriated and the authorization completed. Under the 1956 Act, funds appropriated must be matched by the contribution of funds or land by local agencies or persons.

These funds are used to acquire lands within the Cache National Forest, Utah, which are critical from watershed and erosion standpoint to enable control and minimization of soil, erosion, and flood damage. These are private lands situated on the slopes of the Wasatch Mountains northeast of Ogden, Utah, where vegetation cover and watershed capabilities have been and still are being impaired through overgrazing, fire or logging. Water from the mountains supports the cities, towns, and agriculture in the valleys. Heavy rains on these mountain areas have in the past resulted in serious floods accompanied by mud-rock flows and excessive erosion of the damaged land. Public ownership of these critical lands is a necessary prerequisite to land restoration and Federal and local governmental agencies are cooperating to this end.

Studies made at the time of the enactment of P.L. 84-781 in 1956 revealed that there were approximately 20,000 acres of such land in the most critical category. A total of 7,933 acres have been purchased, or approved for purchase, leaving about 12,000 acres to be acquired.

Available funds are being used to acquire these key properties, this being the most urgent acquisition need on the Cache National Forest.

In addition to these extremely critical lands to which priority is being given, there are some 85,000 acres of private lands within the Cache National Forest that remain to be acquired pursuant to the Forest Receipts Law, Act of May 11, 1938, as amended (52 Stat. 347). As of June 30, 1960, over 25,000 acres have been approved for purchase with funds appropriated under this Act.

(f) Cooperative Range Improvements

Appropriation Act, 1961 and base for 1962	$700,000
Budget Estimate, 1962	700,000

STATUS OF PROGRAM

Part of the grazing fees from the national forests, when appropriated, are used to protect or improve the productivity of the range, mainly by construction and maintenance of fences, stock-watering facilities, bridges, corrals, and driveways. These funds are advanced to and merged with the appropriation "Forest protection and utilization," subappropriation "Forest land management."

FORMULA FOR APPROPRIATION

Section 12 of the act of April 24, 1950 (Granger-Thye Act) provides that of the moneys received from grazing fees by the Treasury from each national forest during each fiscal year there shall be available at the end thereof when appropriated by Congress an amount equivalent to 2 cents per animal-month for sheep and goats and 10 cents per animal-month for other kinds of livestock under permit on such national forest during the calendar year in which the fiscal year begins.

The appropriation for this item since fiscal year 1951 has been $700,000, except for fiscal years 1954 and 1955 when $531,000 and $400,000 was appropriated. Since the actual use figures are not available until after more than one-half of the fiscal year for which funds are appropriated has elapsed; the 1962 appropriation request of $700,000 necessarily represents the best current approximation of the amount which will become available in the calendar year 1961 under the animal-months of use formula.

For calendar year 1959, the latest available figures, use amounted to 5,505,111 animal-months for cattle and horses; 7,102,566 animal-months for sheep and goats; and 3,290 for swine. This use under the 2 cents and 10 cents formula calculates to $692,891.

(Revised)

(g) Assistance to States for Tree Planting

Appropriation Act, 1961	- -
Revised Budget Estimate, 1962	$1,000,000
Increase:	
Original Budget Estimate	- -
Budget Amendment	+1,000,000
Total increase (for carrying out the provisions of Title IV of the Agricultural Act of 1956, to assist the State Forester or equivalent State official, by means of advice, technical assistance, and financial contribution, to carry out increased tree planting and reforestation work in accordance with plans submitted by the State and approved by the Secretary of Agriculture)	+1,000,000

PROJECT STATEMENT

Project	1960	1961	Increase (Budget amendment)	Revised estimate, 1962
Tree planting[a/]	$1,776	- -	+$1,000,000(1)	$1,000,000
Unobligated balance brought forward	-1,776	- -	- -	- -
Appropriation or estimate	- -	- -	1,000,000	1,000,000

a/ Represents obligations. Applied costs for 1960 are $3,128. The difference of $1,352 reflects contractual services received and payments earned by the States in excess of contracts and commitments made in fiscal year 1960.

INCREASE

(1) An increase of $1,000,000 is requested for this item, as explained below.

Need for Increase.--There are more than 42 million acres of nonstocked or partially stocked non-Federal commercial forest land in need of planting and reforestation. If these lands are to contribute adequately to the future supply of industrial wood the tree planting and reforestation work on them will need to be accelerated. Such reforestation would not only add to the economic strength of the Nation, but would also bring increased public benefits from other values associated with forest cover. At present the rate of planting on this nonstocked or partially stocked non-Federal commercial forest land is little more than sufficient to offset the additions to the planting needs brought about by fire, insects, diseases, and cutting.

The 1962 budget provides $296,000 under the State and Private Forestry Cooperation subappropriation for forest tree planting. Work authorized under that fund covers only tree seedling production and distribution. The new appropriation here proposed goes further in that it provides for actual planting of the trees in the field as well as direct seeding and measures to contribute to natural seeding.

This increase will reactivate or increase the reforestation work in connection with 23 previously approved reforestation plans and additional acceptable reforestation plans presented by State Foresters and approved by the Department of Agriculture.

This appropriation would provide added stimulus for action by the State Legislatures in providing State funds for the States' share of this program. The Federal share cannot exceed expenditures made by the State. Assurance that Federal funds are available to cover the Federal contribution needed to prosecute the reforestation plans previously approved and those subsequently presented and approved is of primary importance in accomplishing the objectives of the program.

Plan of Work.--This program will be carried out in cooperation with or through the State Forester or equivalent State official. The advice, technical assistance, and financial contribution to be made to the States will be based on tree planting and reforestation plans submitted by the State and approved by the Secretary of Agriculture. These plans will indicate the magnitude of the job, the pertinent justifying factors, a description of the work planned, the expected participation of all interested parties, the estimated time required to complete the plan, and estimated total cost, segregated by Federal, State, landowner, and other sources.

The authority for tree planting and reforestation applies to land suitable for commercial forest production. This program is to be developed on a project area basis in accordance with plans prepared by the State Forester and approved by the Secretary of Agriculture. The need to accelerate tree planting and reforestation within the project area in order that the area will contribute appropriately to the future needs for industrial wood and other benefits such as watershed protection or improvement, economic benefits to under-employment areas, and betterment of recreational and wildlife values will be given primary consideration in the approval of plans by the Secretary of Agriculture. It is contemplated that approximately 100,000 acres of land will be planted or otherwise treated for reforestation during fiscal year 1962.

CHANGE IN LANGUAGE

The revised estimates include proposed new language for this item as follows:

> For expenses necessary to carry out section 401 of the Agricultural Act of 1956, approved May 28, 1956 (16 U.S.C. 568e), $1,000,000, to remain available until expended.

The proposed language would establish a new appropriation and make funds available to carry out the provisions of section 401 of the Agricultural Act of 1956, approved May 28, 1956.

GENERAL PROVISIONS

CHANGES IN LANGUAGE

The estimates include proposed changes in the language of this item as follows (new language underscored; deleted matter enclosed in brackets):

Sec. 201. Appropriations available to the Forest Service for the current fiscal year shall be available for: (a) purchase of not to exceed [ninety-
1 eight] one hundred and fifty passenger motor vehicles of which one hundred
2 and thirty-five shall be for replacement only, and hire of such vehicles; operation and maintenance of aircraft and the purchase of not to exceed
3 [four of which two shall be] two for replacement only; * * * [and] (e) expenses of the National Forest Reservation Commission as authorized by section 14 of the Act of March 1, 1911 (16 U.S.C. 514); and (f) acqui-
4 sition of land and interests therein for sites for administrative purposes, pursuant to the Act of August 3, 1956 (7 U.S.C. 428a).

* * *

[Sec. 203. No part of any appropriation to the Forest Service in this Act
5 shall be used for publicity or propaganda purposes to support or defeat legislation pending before the Congress.]

6 Sec. [204] 203. * * *

The first and second changes in language would provide authority for the Forest Service to purchase 150 passenger motor vehicles of which 135 will be replacements. A complete justification of this need appears in the justification of estimates for motor vehicles.

The third change in language would provide authority for the Forest Service to replace two aircraft. While only two replacements are proposed in the language, it is planned that two additional aircraft will be acquired by transfer from another Federal agency without cost. A justification of these needs appears in the justification of estimates for aircraft.

The fourth change in language would transfer the authorization for purchase of sites needed for Forest Service activities from the "Forest protection and utilization" appropriation to "General Provisions". In addition, the proposed new language would provide more authorization than the $100,000 presently provided in the appropriation for Forest protection and utilization, which is insufficient to meet the needs of the construction program. The backlog of existing sites on national forest lands and those acquired in years past is now nearly all used. The number of sites needed for new buildings has been increasing each year, and the cost of land has been rising.

The Act of March 3, 1925, as amended (16 U.S.C. 555), cited in the present authorization, authorizes the use of not to exceed $50,000 in any one year for the purchase of lands needed for headquarters, ranger stations, dwellings or for other authorized activities of the Forest Service. This has been interpreted as applying to appropriations other than Forest Protection and Utilization during the years in which the Forest Protection and Utilization appropriation item contains a special limitation.

The Act of August 3, 1956 (7 U.S.C. 428a) also authorizes this type of land purchase if provided for in the applicable appropriation or other law. Since the purchase of these sites is related primarily to the funds appropriated each year for construction, it is proposed to omit reference to the Act of March 3, 1925, as amended, and to base the authority for acquisition of needed sites on the Act of August 3, 1956.

If requirements of the Forest Service construction program are to be met in the most economical and orderly way it is not believed that a limitation should be established on the amount which may be used for acquisition of sites. When a satisfactory site is located, negotiations to purchase must be undertaken promptly to acquire the property at the greatest advantage to the Government. The priority among stations requiring sites cannot be determined in advance because of numerous variable factors. Because of market demand for development property in nearby communities and rapidly advancing prices, it is imperative that purchase of sites be consummated promptly upon decision as to need and location. A limitation in the authorization may mean that an advantageous site as to location and price might be lost, i.e., it may be off the market or unreasonably costly later when adequate authorization is available.

The long-range Forest Service building program is the governing factor in site purchases. Obviously none will be purchased that are not needed for this program. The annual limitation as to amount does not afford the greatest economy in the long run--it actually has the following undesirable results in varying degrees:

(a) Increased administrative costs;
(b) Impeded orderly program progress;
(c) Loss of most desirable sites;
(d) Increased cost of sites.

For the reasons given above, the new language does not propose a dollar limitation. The best estimate available at this time is that about $150,000-$300,000 will be required for site purchases in fiscal year 1962. The actual amount will depend primarily on the amount of site donations and fluctuations in land values.

The fifth change in language proposes deletion of Section 203 as this is now included in the General Provisions section of the Government Matters Appropriation Act.

The sixth change retains former Section 204 without change except for renumbering of the Section (from 204 to 203) due to the proposed elimination of Section 203 of the 1961 Appropriation Act.

(h) Roads and Trails for States, National Forests Fund

Appropriation, 1961 and base for 1962	$14,170,000
Budget Estimate, 1962	11,370,000
Decrease (due to an estimated decrease in national forest receipts in fiscal year 1961)	-2,800,000

The permanent appropriation of 10% of national forest receipts pursuant to the Act of March 4, 1913 (16 U.S.C. 501) is transferred to and merged with the annual appropriation for "Forest Roads and Trails." The explanation of the use of these funds is included in the justifications for that appropriation item.

The decrease of $2,800,000 results from an estimated decrease in receipts from sale of timber for fiscal year 1961.

(i) Expenses, Brush Disposal

Appropriation, 1961 and base for 1962 ..... $7,500,000
Budget Estimate, 1962 7,500,000

PROJECT STATEMENT

Project	1960	1961 Estimate	1962 Estimate
1. Brush disposal	$5,585,207	$6,700,000	$7,000,000
2. Advance to "Forest protection and utilization" for fighting forest fires	a/ 798,659	- -	- -
Total available or estimate b/	6,383,866	6,700,000	7,000,000
Unobligated balance brought forward ..	-1,827,786	-4,288,885	-5,887,544
Recovery of prior year advance for fighting forest fires	-1,622,964	-798,659	- -
Unobligated balance carried forward ..	4,288,885	5,887,544	6,387,544
Total pay act costs (P.L. 86-568)	/- -/	/206,500/	/215,000/
Appropriation or estimate	7,222,001	7,500,000	7,500,000

a/ Reflects obligations in 1960 for fighting forest fires which were recovered from the 1961 appropriation for Fighting Forest Fires.

b/ Represents obligations. Applied costs for 1960 are $6,445,297. The difference of $61,431 reflects, primarily, contractual services and equipment used in 1960 in excess of contracts made and orders placed in that year.

STATUS OF PROGRAM

Timber cutting usually increases the fire hazard by increasing the amount of dry fuel in the form of logging slash. In addition to fire hazard this logging slash often is the principal factor contributing to the buildup of insect populations in cutover areas and may increase certain disease infestations. Also, damage may result from postsale movement of logging slash and debris into stream channels.

Because of these factors, national-forest timber sale contracts require treatment of debris resulting from cutting operations or deposit of funds to pay for this work, to the degree necessary to reduce fire hazard and buildup of insect populations to a point near normal, and to remove logging debris which might move into streams after the sale is closed. To the extent that it is economical and expedient to do so, the work is performed by the timber purchaser. When it is not feasible to have him do the work while he is operating in the area, the work is performed by the Government. The Brush Disposal appropriation represents deposits by the timber purchaser to cover costs of the work when it is performed by the Government as authorized under Section 6 of the Act of April 24, 1950 (16 U.S.C. 490).

There is a wide variation among Regions in the effect of timber cutting, and consequently in the manner of treating slash and debris. In the three eastern Regions, the volume cut per acre is relatively low, utilization is close, and the general humid atmospheric conditions result in rapid decomposition of debris. Very little actual slash disposal work is done on sale areas in these three Regions, the exception being in some of the sales in the pine type where a heavier cut per acre is often made, such as the jack pine stands of Minnesota. In such areas slash may be broken up by disking with heavy equipment which mixes it with the mineral soil so that the hazard is reduced and a good seedbed is provided to aid regeneration. However, treatment of slash to prevent insect epidemics is sometimes necessary in these areas.

In contrast to the light slash disposal requirements in the eastern Regions, the cost of slash abatement on most sale areas of the western Regions is high. The type of treatment varies considerably due to different methods of cutting. For instance, clear-cut areas in the Douglas-fir region are broadcast burned. In selectively cut areas the debris may be piled for burning and this may be done over the whole area or only in strips which break the area up into blocks.

When treatment involves reducing the threat of insect or disease buildup, methods selected are coordinated with other treatments of the sale area--principally treatments to reduce fire hazard.

While slash disposal follows general prescriptions within Regions, the individual needs of each sale offering are planned and appraised prior to advertisement and appropriate specific requirements are incorporated into each timber sale contract. In each instance the least expensive method or combination of methods is used which will

attain adequate protection of the area. In some instances adequate protection from fire is attained at less cost by providing additional protection for sale areas until the slash hazard reverts to near normal. Logging debris which moves into water courses under these conditions must be removed. Greater intensity of fire protection for several years and occasional costs for stream clearance may be less costly than complete slash disposal immediately after cutting. In such cases Brush Disposal funds are used in providing the needed manpower and facilities.

(j) Forest Fire Prevention

Appropriation, 1961 and base for 1962	$20,000
Budget Estimate, 1962	20,000

PROJECT STATEMENT

Project	1960	1961 Estimate	1962 Estimate
Forest fire prevention a/	$10,477	$24,580	$20,000
Unobligated balance brought forward	-646	-4,580	- -
Unobligated balance carried forward	4,580	- -	- -
Total pay act costs (P.L. 86-568)	/- -/	/847/	/847/
Appropriation or estimate	14,411	20,000	20,000

a/ Represents obligations. Applied costs for 1960 are $11,560. The difference of $1,083 reflects, primarily, printing and reproduction, supplies and materials received in 1960 over orders placed in that year.

STATUS OF PROGRAM

Current Activities: The Smokey Bear licensing program is an important part of the Cooperative Forest Fire Prevention Campaign which has been in effect for 19 years. The Campaign itself has been conducted each year since 1942 as a cooperative project of the State Foresters and the Forest Service, United States Department of Agriculture, and is a public service program of the Advertising Council. The purpose of this campaign is to utilize the free public service resources of the various national advertising channels such as car cards, poster display systems, radio and television networks and magazine and newspaper allocation plans in developing public cooperation in the prevention of man-caused forest fires. Since 1945, this campaign has been built around Smokey Bear, who has become recognized and accepted by the public as a nationwide symbol of forest fire prevention.

Under authorization of Public Law 359 of the 82nd Congress, the Secretary of Agriculture has issued rules and regulations governing the licensing program. These licenses specify payment of royalties (usually 5%) and set up certain controls for administering the program and collecting the royalties including advance deposits to protect the Government's interest. Such collections, along with appropriated funds are used to finance the Cooperative Forest Fire Prevention Campaign. The best items not only from a standpoint of collecting royalties but also in carrying the forest fire prevention message to the public were Smokey Bear comic books, Smokey Bear stamp books, Smokey Bear scarves, and Smokey Bear cookies.

Selected Examples of Recent Progress

1. In 1959, a Smokey Bear float won the Governor's Trophy in the Rose Bowl Parade in Pasadena. This float, constructed through cooperation of the Forest Service and the Native Sons and Daughters of the Golden West, brought a fire prevention message to an estimated 80 million viewers.

2. A new animated Smokey Bear exhibit, "Smokey and Friends," appeared for the first time in 1959 at the Oregon Centennial, and was a big attraction to the 500,000 people who visited the booth. This exhibit is permanently stationed in the West and is in great demand. Another similar exhibit has been purchased for use in the East.

3. On October 9, 1959, a "Golden Smokey" statuette was awarded to the National Association of Broadcasters, at Stowe, Vermont, in acknowledgment of outstanding public service to the National forest fire prevention campaign.

4. Smokey Bear, the living symbol of forest fire prevention, celebrated his 10th birthday at the National Zoo on February 2, 1960. Ceremonies were televised. A second cake was cut at the Crippled Children's Hospital, where a costumed "stand-in" performed for Smokey.

(k) Restoration of Forest Lands and Improvements

Appropriation, 1961 and base for 1962	$100,000
Budget Estimate, 1962	100,000

PROJECT STATEMENT

Project	1960	1961 Estimate	1962 Estimate
Restoration of forest lands and improvements	$6,381	$107,130	$100,000
Unobligated balance brought forward	-7,083	-7,130	- -
Unobligated balance carried forward	7,130	- -	- -
Total pay act costs (P.L. 86-568)	/- -/	/580/	/800/
Appropriation or estimate	6,428	100,000	100,000

STATUS OF PROGRAM

Recoveries from cash bonds or forfeitures under surety bonds by permittees or timber purchasers, who fail to complete performance, are used to complete improvement, protection, or rehabilitation work on lands under Forest Service administration. Funds received as settlement of a claim are used for improvement, protection or rehabilitation made necessary by the action which led to the cash settlement (Act of June 20, 1958 - 16 U.S.C. 579c).

(1) Payment to Minnesota (Cook, Lake, and St. Louis Counties) from the National Forests Fund

Appropriation, 1961 and base for 1962	$123,300
Budget Estimate, 1962	123,300

PROJECT STATEMENT

Project	1960	1961 Estimate	1962 Estimate
Payment to Minnesota (appropriation or estimate)	$121,309	$123,300	$123,300

STATUS OF PROGRAM

The Act of June 22, 1948, as amended, (16 U.S.C. 577c-577h) provides that the Secretary of the Treasury, upon certification of the Secretary of Agriculture, shall pay to the State of Minnesota at the close of each fiscal year an amount equivalent to three-fourths of one percent of the fair appraised value of certain national forest lands in the counties of Cook, Lake, and St. Louis situated within the Superior National Forest. The Act further provides that payment to the State shall be distributed to each of these counties in conformity with the fair appraised value of such national forest lands in each county.

(m) Payments Due Counties, Submarginal Land Program, Farm Tenant Act (Permanent Appropriation)

Appropriation, 1961 and base for 1962	$425,000
Budget Estimate, 1962	425,000

PROJECT STATEMENT

Project	1960	1961 Estimate	1962 Estimate
Payments due counties (appropriation or estimate)	$452,894	$425,000	$425,000

STATUS OF PROGRAM

At the end of each calendar year, 25% of the revenues from the use of submarginal lands are paid to counties under the provisions of Title III of the Bankhead-Jones Farm Tenant Act, approved July 22, 1937 (7 U.S.C. 1012).

(n) Payments to School Funds, Arizona and New Mexico, Act of June 20, 1910

Appropriation, 1961 and base for 1962	$139,700
Budget Estimate, 1962	139,700

PROJECT STATEMENT

Project	1960	1961 Estimate	1962 Estimate
Payments to school funds (appropriation or estimate)	$113,861	$139,700	$139,700

STATUS OF PROGRAM

Under provisions of the Act of June 20, 1910 (36 Stat. 562,573) certain areas within national forests were granted to the States for school purposes. The percentage that these lands are of the total national forest area within the State is used in determining payments to the States. The receipts from all national forest land within the State are used as the basis for applying the percentage. For example, if total receipts for the State are $100,000 and if 10% of lands are in the "granted for school purposes" category, the payment to the State would be $10,000. The amounts so paid are deducted from the net receipts before computing the 25% payments to States.

As soon after the close of the fiscal year as the receipts from national forests and the area of school lands in the States of Arizona and New Mexico are determined, the payments are made to the States. Estimated payments in fiscal year 1961 to Arizona will be $138,922 and to New Mexico $804.

(o) Payments to States and Territories from the National Forests Fund

Appropriation, 1961 and base for 1962	$35,400,000
Budget Estimate, 1962	28,400,000
Decrease (due to an estimated decrease in the national forest receipts for the fiscal year 1961)	-7,000,000

PROJECT STATEMENT

Project	1960	1961 Estimate	Decrease	1962 Estimate
Payments to States and Territories (appropriation or estimate)	$29,668,588	$35,400,000	-$7,000,000(1)	$28,400,000

DECREASE

(1) The decrease of $7,000,000 in this item for payments to States and Territories in the fiscal year 1962 results from an estimated decrease in national forest receipts for the fiscal year 1961.

STATUS OF PROGRAM

The Act of May 23, 1908, as amended (16 U.S.C. 500) requires, with a few exceptions, that 25% of all money received from the national forests during any fiscal year be paid to the States and Territories in which the forests are located, for the benefit of public schools and public roads of the county or counties in which such national forests are situated. The amount of this appropriation varies each year in direct proportion to national forest receipts during the previous fiscal year.

The amounts set aside from receipts collected for the sale of national forest timber, grazing and special use permits, etc., before the 25% is applied are listed below:

1. Payment to the State of Minnesota covering certain national forest lands in the Counties of Cook, Lake, and St. Louis situated within the Superior National Forest, is made under the terms of the Act of June 22, 1948, Public Law 733. Receipts collected from the areas covered by this Act are excluded when the 25% payment to the State of Minnesota is computed.

2. For lands in certain counties in Utah, Nevada, and California, the States receive 25% of receipts only after funds, if made available by Congress, have been set aside for the acquisition of national forest lands within the specified national forests under the terms of special acts authorizing appropriations from forest receipts for this purpose.

3. Payments to the States of Arizona and New Mexico under the provisions of the Act of June 20, 1910, of shares of the gross receipts from the national forests in those States which are proportionate to the areas of land granted to the States for school purposes within the national forests.

(p) Construction of Warehouse and Related Facilities, Salt Lake City, Utah

PROJECT STATEMENT

Project	1960	1961 Estimate	1962 Estimate
Construction of warehouse and related facilities, Salt Lake City, Utah	- -	$24,682	- -
Unobligated balance brought forward	- -	-24,682	- -
Unobligated balance carried forward	$24,682	- -	- -
Appropriation or estimate	24,682	- -	- -

STATUS OF PROGRAM

Funds from the sale of a Forest Service fire warehouse lot together with improvements thereon, to Salt Lake City, Utah, are being used in fiscal year 1961 for the construction of other similar facilities (72 Stat. 589).

(q) Working Capital Fund, Forest Service

This fund finances on a reimbursable basis various services such as repairing and replacing equipment, including aircraft, stocking and issuing supplies, operation of photographic and reproduction facilities, and tree nurseries in support of programs of the Forest Service (16 U.S.C. 579b). These service activities facilitate the operation of programs of fire protection, timber utilization, construction and maintenance of roads and other improvements, reforestation, grazing, watershed, forest and forest products research, and kindred conservation activities of the Forest Service, including cooperative assistance with other Federal agencies, States, counties, and individuals engaged in the same objectives.

Operating results and financial condition.--Government investment in the fund as of June 30, 1960, including donated assets at its inception and retained earnings for fiscal year 1960, is $20,517,873. By the end of 1962 the investment is anticipated to be $23,747,000, an increase of $3,229,127, which represents estimated earnings and donations during 1961 and 1962. Earnings are retained to furnish adequate working capital.

(r) Cooperative Work, Forest Service (Trust Fund)

Contributions are received from cooperators, including counties, States, timber sale operators, individuals, and associations, and are expended by the Forest Service in accordance with the terms of the applicable cooperative agreements. The work consists of protection and improvement of the national forests, work performed for national forest users, and forest investigations and protection, reforestation, and administration of private forest lands.

The major programs conducted under the account "Cooperative Work, Forest Service" are described below in terms of the projects reflected in the statement at the end of this section.

1. Construction and Maintenance of Roads and Trails, and

2. Construction and Maintenance of Other Improvements:

   Under the Acts of June 30, 1914 (16 U.S.C. 498) and March 3, 1925 and April 24, 1950 (16 U.S.C. 572) deposits for cooperative work are accepted from State and local government agencies, associations, Federal timber purchasers, and others for the construction and maintenance of roads, trails, and other improvements and for performing work which is the national forest users' responsibility, this method of performance of the work being of mutual benefit or of benefit to the public at large.

3. Protection of National Forests and Adjacent Private Lands: The Act of June 30, 1914 (16 U.S.C. 498) authorizes the acceptance of deposits for the protection of the national forests and the Act of March 3, 1925, as amended by Section 5, Act of April 24, 1950 (16 U.S.C. 572), authorizes the acceptance of contributions for the protection of private lands in or near the national forests. The major portion of the obligations is for the protection of private lands from fire. This arrangement helps both parties since there are millions of acres of private forest land intermingled with Federal ownership on the national forests. The lands in private ownership are usually in small tracts. It would be uneconomical for the owner to set up a fire control organization for the protection of his land. The advantage to the Government is that in many cases it would be necessary to suppress the fires on the private land without reimbursement in order to protect the adjoining Federal land.

4. Sale Area Betterment (including reforestation): Under Section 3 of the Act of June 9, 1930 (16 U.S.C. 576b) funds are collected from timber sale operators to insure establishment, after cutting, of a new crop and to take special measures to improve the quality of the future crop of timber. Such expenditures are essential to maintain productivity on many sale areas and to insure marketability of the next stand of timber. These funds are used on the areas cut over by timber purchasers.

In the Lake States region, these funds are used largely for reforestation to supplement and improve natural regeneration on the cutover areas. In the South, a major problem is to control inferior hardwoods and thereby maintain a balance between desirable hardwoods and pine on the highly productive pine-producing land and most of the amount collected is used for removing worthless trees which otherwise would crowd out seedlings of desirable species, either hardwood or pine, on cutover areas.

During fiscal year 1960, obligations for sale area betterment work on all national forests totaled approximately $11.9 million.

Accomplishments for this program are reported under the Forest Land Management subappropriation along with accomplishments for reforestation and stand improvement for that subappropriation.

5. Scaling: Under provisions of the Act of April 24, 1950 (16 U.S.C. 572) and of Section 210 of the Act of September 21, 1944 (16 U.S.C. 572a) acceptance of deposits from timber purchasers for cooperative scaling service is authorized. Such arrangements are established only when requested by the operator and when the operator pays the extra cost of such services.

6. Research Investigations: The Acts of June 30, 1914 (16 U.S.C. 498) and May 22, 1928 (16 U.S.C. 581i-1) authorize the acceptance of deposits for forestry research. Deposits are received from State and other public agencies, and from industrial, association, and other private agencies to finance research projects of mutual interest and benefit to both parties. The deposits may be made either in a single sum or on a continuing basis, and may either partially or wholly cover the cost of the research. The cooperative research projects may involve any aspect of forestry and varies widely as to scope and duration. A very common example of such cooperation is for a State to make a deposit to the cooperative work fund in order to intensify or to speed up completion of a comprehensive survey of the forest resources of the State. Other examples are State contributions toward forest fire research. The results of such cooperative investigations are made available to the general public as well as to the depositor.

7. Administration of Private Lands: The Act of March 3, 1925, as amended by Section 5, Act of April 24, 1950 (16 U.S.C. 572) authorizes the acceptance of contributions for the management of private lands. These contributions are made by private owners having land intermingled with or adjacent to national forests who wish these lands managed in accordance with good forest management practices. Their holdings are usually too small to warrant the employment of professional foresters to administer such tracts. The advantages to the Government include the avoidance of possible high fire hazard areas resulting from improper cutting practices, the elimination of the necessity of precisely marking the boundaries of the private land, and additional private forest land handled under proper forest practices.

8. Reforestation (private lands): The Act of March 3, 1925, as amended by Section 5, Act of April 24, 1950 (16 U.S.C. 572) authorizes the acceptance of contributions for reforestation of private lands situated within or near a national forest. This work is limited to areas of private land within a planting project on the national forests or to areas in which certain civic and other public-spirited organizations have taken an interest.

9. Statement on Utilization of Funds: Following is a statement of funds received and obligated and balances available by major activities:

COOPERATIVE WORK, FOREST SERVICE

Trust Fund

Project	Balance Available June 30, 1959	Actual fiscal year 1960			Estimate fiscal year 1961			Estimate fiscal year 1962		
		Funds Received	Obligations	Balance	Funds Received	Obligations	Balance	Funds Received	Obligations	Balance
1. Construction and maintenance of roads and trails	$797,494	$1,479,866	$1,183,692	$1,093,668	$1,400,000	$1,300,000	$1,193,668	$1,400,000	$1,300,000	$1,293,668
2. Construction and maintenance of other improvements	309,032	898,147	821,417	385,762	800,000	600,000	585,762	800,000	600,000	785,762
3. Protection on national forests and adjacent private land:										
(a) Fire	272,028	1,510,019	1,415,003	367,044	1,500,000	1,600,000	267,044	1,500,000	1,600,000	167,044
(b) Other	856,240	1,221,933	1,130,342	947,831	1,200,000	1,000,000	1,147,831	1,200,000	1,000,000	1,347,831
4. Sale area betterment on national forest lands (including reforestation)	12,321,494	15,263,369	11,913,025	15,671,838	15,940,000	15,330,000	16,281,838	16,440,000	15,830,000	16,891,838
5. Scaling of timber	178,536	541,353	525,113	194,776	500,000	500,000	194,776	500,000	500,000	194,776
6. Research investigations	302,307	1,028,308	919,255	411,360	1,000,000	1,000,000	411,360	1,000,000	1,000,000	411,360
7. Administration of private lands	12,394	56,157	54,065	14,486	60,000	55,000	19,486	60,000	55,000	24,486
8. Reforestation (private lands)	109,450	95,252	110,564	94,138	100,000	115,000	79,138	100,000	115,000	64,138
Total	15,158,975	22,094,404	18,072,476	19,180,903	22,500,000	21,500,000	20,180,903	23,000,000	22,000,000	21,180,903

Note:--Balances carried forward are due primarily to necessity of deferring work for which funds are deposited until the most practicable time. For instance, funds for sale area betterment are received in advance of cutting, but work cannot be started until cutting operations are completed. The time lag sometimes extends for several years, depending on the amount of preparatory work required in the sale area, weather conditions, etc.

Above obligations for 1960 include refunds to cooperators of $125,660.

STATEMENT OF OBLIGATIONS UNDER ALLOTMENTS AND OTHER FUNDS

(Includes only those amounts which, by November 30, 1960, were actually received or programmed for 1961 or 1962. Since work for other agencies is performed on a service basis, at the request of those agencies and for their benefit, it is not practicable to estimate in advance the amounts to be received in some cases.)

Item	Obligations, 1960	Estimated Obligations, 1961	Estimated Obligations, 1962
Allotments from:			
Watershed Protection, Soil Conservation Service - For planning, installing improvement measures, and investigations in river basins in connection with watershed protection activities	$878,908	$1,332,230	$1,205,000
Flood Prevention, Soil Conservation Service - For measures primarily for flood prevention (works of improvement)	2,324,726	2,367,600	2,156,000
Great Plains Conservation Program, Soil Conservation Service - For research services, advice and guidance to agencies conducting nursery production and tree planting phases of the Great Plains Conservation Program	31,288	16,850	16,850
Agricultural Conservation Program Service - For cooperation in administering the naval stores program	128,967	140,000	140,000
Conservation Reserve Program, Commodity Stabilization Service - For assistance in the conservation reserve program, primarily for expansion of production of tree seedlings	1,329,120	600,600	149,000
Total, Allotments	4,693,009	4,457,280	3,666,850
Allocations (Advance from other Agencies):			
International Cooperation Administration - For economic and technical assistance programs	224,769	171,350	176,470
Department of the Army - For relocation and replacement of Forest Service facilities necessitated by development of dams and reservoirs	4,839	- -	- -
Office of Civil and Defense Mobilization:			
For rural fire defense program	14,714	- -	- -
For radiological defense training ..	12,035	20,000	32,500
Total, Office of Civil and Defense Mobilization	26,749	20,000	32,500
Total, Allocations	256,357	191,350	208,970

(Continued on next page)

Item	Obligations, 1960	Estimated Obligations, 1961	Estimated Obligations, 1962
Trust Funds:			
Cooperative Work, Forest Service:			
Trust funds deposited by cooperators for the accomplishment of certain projects which are of mutual benefit to the Forest Service and such co-operators as follows:			
1. Construction and maintenance of roads and trails	1,183,692	1,300,000	1,300,000
2. Construction and maintenance of other improvements	821,417	600,000	600,000
3. Protection of national forests and adjacent private land	2,545,345	2,600,000	2,600,000
4. Sale-area betterment	11,913,025	15,330,000	15,830,000
5. Scaling of timber	525,113	500,000	500,000
6. Research investigations	919,255	1,000,000	1,000,000
7. Administration	54,065	55,000	55,000
8. Reforestation	110,564	115,000	115,000
Total, Cooperative Work	18,072,476	21,500,000	22,000,000
Miscellaneous Contributed Funds (principally cooperative work on blister rust control)	4,986	585	- -
Total, Trust Funds	18,077,462	21,500,585	22,000,000
Obligations under Reimbursements from Governmental and Other Sources:			
Forest protection and utilization a/	3,967,984	5,100,000	5,100,000
Forest roads and trails and Roads and trails for States b/	320,646	2,000,000	2,000,000
All other	24,790	271,000	271,000
Total, Reimbursements	4,313,420	7,371,000	7,371,000
TOTAL, OBLIGATIONS UNDER ALLOTMENTS AND OTHER FUNDS	27,340,248	33,520,215	33,246,820

a/ Primarily from other Government agencies, States, and countries, for forest fire protection and suppression, insect and disease control, forest research, investigations at Forest Products Laboratory, surveys, land appraisals, mapping cruising timber, preparation of timber management plans, snow scale readings, and other miscellaneous services.

b/ Primarily road construction for U. S. Army.

NOTE--In addition, foreign currencies are available under Section 104(k) of Public Law 480 for forest research projects abroad. This work is conducted by the Agricultural Research Service of the Department of Agriculture with the assistance of the Forest Service in the review and appraisal of forest research projects undertaken abroad. The dollar expenses of the Forest Service in connection with this work are paid from the appropriation "Forest protection and utilization."

PASSENGER MOTOR VEHICLES AND AIRCRAFT

Purchase of passenger motor vehicles

During fiscal 1962 it is proposed to replace 135 passenger cars, 11 of which are station wagons, all of which will meet replacement standards. It is also proposed to purchase 15 additional passenger cars.

Based on the planned schedule of replacements and purchase of additions, the Forest Service will have a total of 626 passenger vehicles, exclusive of 4 busses, in fiscal 1962. On analysis of vehicle use and age pattern, it is expected that 140 units will meet or exceed replacement standards before replacements are received.

As of June 30, 1960, the age and mileage classes of the Forest Service passenger vehicles were:

Age Data		Mileage Data	
Year Model	No. of Vehicles	Lifetime Mileage	No. of Vehicles
1955 or older	85	80,000 to 100,000	1
1956	125	60,000 to 80,000	29
1957	119	40,000 to 60,000	215
1958	124	20,000 to 40,000	195
1959	83	0 to 20,000	171
1960	75	Total	611
Total	611		

Use of vehicles

Passenger motor vehicles are used by (1) forest officers in the protection, utilization, management, and development of the national forests and land utilization projects and in the program for control of forest pests; (2) research technicians on experimental forests and ranges, on field research projects and forest surveys; (3) foresters engaged in carrying out the laws providing for State and private forestry cooperation; and (4) regional office field-going administrative officers in performing, directing, and inspecting field work.

The Forest Service is essentially a field organization and its passenger motor vehicles are located mainly at regional, national forest, and ranger district headquarters, land utilization projects, and experiemental forests and ranges. There are over 232 million acres within the exterior boundaries of the national forests and land utilization projects. About 435 million acres of State and private forest land are included within the areas which benefit from Federal participation in the cooperative forest program. Much of this area is without common carrier service, and most forest areas and research centers are remote from commercial travel routes, requiring extensive use of motor vehicles as a means of transportation. The major portion of transportation needs, particularly at forest regional and supervisor levels and at other larger headquarters, involves multiple passenger use and can be more expeditiously and economically met by use of sedans and station wagons than by other types of vehicles.

Justification of Replacements

Dependability of passenger vehicles is an important factor in keeping work programs on schedule and in meeting emergencies. Vehicle breakdowns while on field travel cause disruptions and delays in field work as well as loss of effective work time of employees. The continued use of over-age equipment is undesirable from a safety standpoint since most of it is operated over rough narrow winding roads in mountainous country under adverse conditions. This use results in excessive operating and repair expenses when vehicles reach or exceed replacement standards.

In order to maintain passenger cars in a safe and satisfactory operating condition, it is the policy of the Forest Service to schedule periodic preventive maintenance inspections, services, and tune-ups to reduce the necessity for costly major repairs and overhauls, and to minimize lost time resulting from field breakdowns.

It is desirable to maintain a reasonable balance in the age class of the passenger vehicle inventory. The age class distribution is based upon conforming with replacement standards which recognize that some units will be retired under the age standard and others under the use standard. Prescribed replacement standards, although applicable, are not always appropriate for all Forest Service vehicles because of the wide range of operating conditions and the comparatively short field season in many of the national forests at higher elevations. Decision on replacement of passenger vehicles which reach replacement age is based on an appraisal of each unit. This involves a review of the history record combined with a mechanical inspection of the vehicle's condition and repair liability. When such appraisal indicates that the vehicle is satisfactory for further service without unreasonable repair expenditures, it is retained and assigned to lighter work, even though such action tends to upset the age standards for the fleet inventory.

The vehicles selected for replacement are those which it has been determined cannot be operated another season without excessive repair expense. They are unsatisfactory for further use both as to safety and mechanical condition.

The passenger car replacements requested for fiscal year 1962 exceed the number requested in fiscal year 1961 by 37 units. This is caused by a changing age pattern in the fleet structure due to increased vehicle use resulting from expanding activities primarily in timber sales, research, and public use of national forest recreational facilities. More vehicles are expected to reach or exceed prescribed replacement standards in fiscal year 1962 than in fiscal year 1961. The increased replacement authorization to a total of 135 units compared with 98 in fiscal year 1961 is within the normal annual replacement standards prescribed by General Services Administration.

Essentially all passenger vehicles are pooled for use by all activities with replacement of pooled units financed from a Working Capital Fund. All appropriations reimburse this fund in ratio to use of vehicles on activities financed by the respective appropriations.

Justification of the Additional Vehicles

The Forest Service analyzes current work plans and programs in determining its overall passenger car requirements. This analysis includes a careful study of the number of vehicles needed at each field station, using as a guiding principle the ownership of only the minimum number of dependable units required to serve programs for which funds are budgeted. Also, it is Forest Service policy to utilize Inter-Agency Motor Pools or commercial car rental services to the fullest practicable extent. Passenger car use is restricted and is integrated with various activities so as to attain good utilization of all vehicles. During the past ten years, there has been a steady reduction in the number of passenger cars owned by the Forest Service. This has been possible because of better utilization practices and through the assistance of Inter-Agency Motor Pools. Because of this reduction, it is becoming more difficult to meet requirements for passenger car transportation resulting from increasing job loads. Expanding activities in research, timber sales, public use of recreational facilities, fire protection and other land management activities, are increasing the need for more passenger cars. These increasing needs are being met in some areas through greater use of Inter-Agency Motor Pool vehicles. These pools, however, serve only very small parts of the total land area administered by the Forest Service; therefore, increasing requirements for passenger car transportation in several areas cannot be fully met except through purchase of additional units for the Forest Service fleet.

Replacement and Addition of Aircraft

The 1962 estimates propose replacement of two airplanes and addition of two aircraft. The Forest Service currently has 56 aircraft:

12 light reconnaissance airplanes
14 medium and heavy cargo and transport airplanes
(11 medium; 3 heavy)
2 forest spray airplanes (Stearman and TBM)
1 helicopter
4 torpedo bomber airplanes
23 T-34B lead airplanes (2 place scout)

The 26 reconnaissance and transport airplanes are used primarily to transport administrative personnel, firefighters, smokejumpers, equipment and supplies to remote and inaccessible areas where commercial service is inadequate or not available for detection and suppression of forest fires. They are used to locate and survey timber stand and vegetation conditions such as insect infestations, blowdown, diseased areas and undesirable species, and to appraise resources and damage and evaluate effectiveness of control.

The helicopter is used for training forest personnel in tactical use of helicopters and for experimental development on techniques and equipment for direct tactical suppression of forest fires.

The torpedo bomber airplanes are used as air tankers for bulk dropping of retardants on forest fires, training Forest Service personnel as lead plane pilots and developing and testing new improved methods of dropping fire retardants.

The twenty-three T-34B "lead" airplanes are used primarily by air attack bosses to direct and control the dropping of fire retardants on forest fires by more than 150 tanker airplanes.

It will be necessary to replace two reconnaissance airplanes. These aircraft have reached an age and total number of flying hours on the airframe where it is uneconomical to overhaul or modernize them to meet the airworthiness requirements of Civil Air Regulations. Forest Service aircraft are operated to a large extent over rough mountainous terrain where landing fields are poor and scarce. It is especially important that these aircraft be maintained for maximum performance and dependability.

The proposed replacement aircraft are needed to direct and control air attack on forest fires by privately-owned airtankers and helicopters, to facilitate detection patrol and reconnaissance, to conduct experiements and field tests of new aerial attack devices and techniques, and to transport smokejumpers, firefighters, equipment and supplies in remote areas where airplane services of commercial operators are inadequate or unavailable. In addition, they are needed for locating, surveying and appraising resources, damages and effectiveness of control.

The two additional aircraft requested will be large cargo and personnel transport airplanes. Suitable airplanes are available, and will be obtained on transfer, without reimbursement from the military services. The need for these additions results from the rapid increase in use of aircraft primarily for fire suppression and the lack of suitable aircraft available from commercial sources. During the 1960 season four well-trained, highly mobile, self-sufficient 30-men firefighting crews were established at strategically located bases in the western states. These crews are transported by airplane to bolster suppression forces when initial attack fails, or critical conditions develop anywhere in the west. Commercial sources are not always able to provide timely and suitable airplane services required for the mobile crews, and the transportation of overhead and firefighters as needed.

The large cargo and transport airplanes will also be used for dropping smokejumpers and paracargo. Increased use of jumpers and rapid retrieving of them by helicopters for additional jumps requires additional airplanes for this type of work.

Commercial aircraft services may not be available when needed, or may not be equipped with the needed specialized equipment, or may be inadequate to meet special requirements. Since Forest Service use is seasonal, commercial operators must usually depend on other sources for their principal income. Consequently few private owners have the right type of aircraft or are able to modify them for special firefighting service. It is necessary therefore to depend primarily on government-owned equipment to meet these special services which the government-owned fleet is planned to provide.